NBS SPECIAL PUBLICATION 363

SUPPLEMENT 1

U.S. DEPARTMENT OF COMMERCE / National Bureau of Standards

Bibliography on Atomic Energy Levels and Spectra

July 1971 through June 1975

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[1] Headquarters and Laboratories at Gaithersburg, Maryland, unless otherwise noted; mailing address Washington, D.C. 20234.

[2] Located at Boulder, Colorado 80302.

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July 1971 through June 1975

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Foreword

The National Standard Reference Data System was established in 1963 for the purpose of promoting the critical evaluation and dissemination of numerical data of the physical sciences. The program is coordinated by the Office of Standard Reference Data of the National Bureau of Standards but involves the efforts of many groups in universities, government laboratories, and private industry. The primary aim of the program is to provide compilations of critically evaluated physical and chemical property data. These tables are published in the *Journal of Physical and Chemical Reference Data*, in the NSRDS–NBS series of the National Bureau of Standards, and through other appropriate channels.

The task of critical evaluation is carried out in various data centers, each with a well-defined technical scope. A necessary preliminary step to the critical evaluation process is the retrieval from the world scientific literature of all papers falling within the scope of the center. Each center, therefore, builds up a comprehensive well-indexed bibliographical file which forms the base for the evaluation task. Bibliographies derived from these files are published when they appear to be of value to research workers and others interested in the particular technical area.

Further information on NSRDS and the publications which form the primary output of the program may be obtained by writing to the Office of Standard Reference Data, National Bureau of Standards, Washington, D.C. 20234.

David R. Lide, Jr., *Chief*
Office of Standard Reference Data

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Bibliography on Atomic Energy Levels and Spectra July 1971 through June 1975

Lucy Hagan

This is the first supplement to the NBS Special Publication 363, "Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971," and it covers the most recent literature from July 1971 through June 1975. It contains approximately 2150 references classified by subject for individual atoms and atomic ions. A number index identifies the references. An author index is included. References included contain data on energy levels, classified lines, wavelengths, Zeeman effect, Stark effect, hyperfine structure, isotope shift, ionization potentials, or theory which gives results for specific atoms or atomic ions.

Key words: Atomic energy levels; atomic spectra; bibliography; energy levels, atomic; spectra, atomic; wavelengths, atoms and ions.

1. Introduction

Since the publication of *Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971* [1][1] by the Atomic Energy Levels Data Center, over 2150 research papers have appeared which contain numerical data. This is twice the number of references included in the previous bibliography and represents an increase of approximately 170 per year compared to the years covered previously. This first supplement contains references to these new papers which have a journal publication date up to June 30, 1975 and were available to us as reprints or in journals in our library. In this supplement the format is the same as in the previously published bibliography.

1.1. Reference Classification Scheme and Scope of Bibliography

The references included contain numerical data on atomic energy levels and spectra. The reference classification categories are the same as used in the previous bibliography and are summarized below. One additional category, QF, has been added for papers containing numerical data on Lamb shifts, either experimental or theoretical results.

EL Energy Levels. Experimental energy differences, except Hfs or IS. Includes references that suggest the rejection of previously reported levels.

ND New Designations. New or changed designations or *J* values for known energy levels.

CL Classified Lines. Indicates the assignment of observed lines to transitions between energy levels that are specified by theoretical designations and/or by their positions in a known level scheme.

W Wavelengths (or wavenumbers). New measurements, or wavelengths newly assigned to a particular spectrum. References that list measurements of other entities corresponding to energy differences between levels may also be included.

ZE Zeeman Effect data or interpretation.

SE Stark Effect data or interpretation.

Hfs Hyperfine Structure. Observations and theory.

IS Isotopic or Isomeric (Nuclear) Shifts.

QF Quantum Field effects. Lamb shifts, experimental and theoretical results.

IP Ionization Potential.

SF Series Formulae. Evaluated series constants, including those appearing in polarization-theory formulae.

TE Theoretical Engeries. Restricted to a few references that give calculated energy levels with accuracies about equal to or exceeding those now obtainable by observation.

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[1] Figures in brackets refer to the literature references in section 1.3 on page

PT Parametric Theory. Evaluations of the usual energy parameters of Slater-Condon theory, or extensions thereof, based on fitting the theory to experimental levels, *g*-factors and/or other observed quantities.

AT Ab initio Theory. These references are mostly to Hartree-Fock type calculations of energy parameters or levels.

OT Other Theory. Predictions of energy levels by theoretical methods not primarily classifiable as PT or AT (for example, Z expansion techniques).

It is worth noting that this bibliography does not contain references to atomic transition probabilities, line intensities, or broadening. The NBS Data Center on Atomic Transition Probabilities and Atomic Line Shapes and Shifts publishes bibliographies on these subjects [2].

This bibliography is further restricted, with few exceptions, to original research papers or monographs; textbooks and extensive compilations of special interest that are not included in the classified references are given at the end of this introduction in section 1.4.

1.2. Arrangement of Bibliography and Handling of Special Types of References

Each reference has been assigned a number. In section 2.2 the appropriate reference numbers are given under headings for individual spectra (element and ionization stage). The reference numbers under each spectrum heading are listed separately for each of the content categories explained above. Reference numbers for papers reporting wavelengths of unknown ionization stage are given as the last group for the element.

The full references are given in order of the assigned numbers in section 3. Each such reference is followed by the spectra and category symbols appropriate to the content. Except for Russian titles, which are given in English, the titles of articles are given in the language in which they were published. References to articles from Russian journals that also appear in English translations are usually to the translation journals.

Section 2.1 is an index to the spectra for which there are references, and an author index (sec. 4) follows the listing of the complete references.

The main exception from the arrangement described above is for the references 3300 through 3533. Each of these papers gives theoretical results for a rather large number of elements and/or ionization stages and their numbers are followed by a "T" to indicate that the papers give theoretical results only. These references are included in section 4, along with the usual information on their content, and in the author index. However, they were omitted from the reference numbers for the individual spectra (sec. 2.2).

Most of the reference numbers followed by an "A" indicate abstracts of papers presented at meetings of the Optical Society of America, the American Physical Society, or the European Group for Atomic Spectroscopy. The assigned content categories for these abstracts are those thought to be applicable to the paper itself, as indicated by the abstract; the indicated results are not necessarily included in the abstracts. These abstracts frequently provide information about work in progress. A few of the "A" references are to abstracts of theses in Dissertation Abstracts. Some of the other references are to theses for which the AEL Data Center has obtained copies.

References to lanthanide and actinide atomic energy levels and spectra determined from solution or crystal data are included for atoms and atomic ions for which these data have not been determined for the free gaseous atom or ion. Papers older than 1971 have also been included for this particular subject to make the bibliography complete, since these references were not included in previous bibliographies. For these references the reference classification categories which apply are enclosed in parentheses to differentiate them from articles to atomic energy levels and spectra of free gaseous atoms and atomic ions.

Abbreviations of titles of publications cited in this bibliography are those given in the 1970 edition of Chemical Abstracts Source Index [3].

I am grateful to Dr. W. C. Martin for helpful discussions and consultation. I am indebted to Dr. David Garvin, who suggested the original format for references, which has been used with his computer programs for this bibliography. James Koch has been especially helpful in resolving difficulties with the many computer programs used; I am grateful for his help. I thank Keith Draxl, who revised the author sort program and put it into operations with the modifications required. I thank the NSRDS staff, particularly Carla Messina, who revised the reformat program, and Robert Thompson for helpful comments about the programs. I especially thank Kathy Strine for the difficult job of keyboarding the references, putting the references in a consistent format, and for running many of the computer programs to put the bibliography onto magnetic tape. I thank Marsha Ahalt for her assistance in proofreading the bibliography.

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2. Classified References for Individual Spectra

2.1. Index to Spectra

Element	Z	Spectrum	Page
Actinium	89	Ac I	45
Aluminum	13	Al$^-$	18
		Al I	
		Al II	
		Al III	
		Al IV	
		Al V	
		Al VI	
		Al VII	
		Al VIII	
		Al IX	
		Al X	
		Al XI	
		Al XII	
		Al XIII	
Americium	95	Am III	46
		Am IV	
		Am V	
		Am VI	
		Am LXXXV	
Antimony	51	Sb$^-$	38
		Sb I	
		Sb II	
		Sb VII	
Argon	18	Ar$^-$	21
		Ar I	
		Ar II	
		Ar III	
		Ar IV	22
		Ar V	
		Ar VI	
		Ar VII	
		Ar VIII	
		Ar IX	
		Ar X	
		Ar XI	
		Ar XII	
		Ar XIII	
		Ar XIV	
		Ar XV	
		Ar XVI	
		Ar XVII	
		Ar XVIII	
		Ar XIX	
		Ar	
Arsenic	33	As$^-$	33
		As I	
		As II	34
		As XIV	
		As XV	
		As XVI	
		As XVII	
		As XVIII	
		As XXI	
		As XXII	
		As XXIII	
Barium	56	Ba I	40
		Ba II	
		Ba III	
Berkelium	97	Bk I	46
		Bk II	
		Bk IV	
		Bk V	
Beryllium	4	Be I	13
		Be II	
		Be III	
		Be IV	
Bismuth	83	Bi$^-$	45
		Bi I	
		Bi II	
		Bi IV	
Boron	5	B$^-$	13
		B I	
		B II	
		B III	
		B IV	
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Bromine	35	Br$^-$	34
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		Br XVI	
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		Br XXIV	35
		Br XXV	
		Br XXVI	
Cadmium	48	Cd$^-$	38
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Calcium	20	Ca$^-$	23
		Ca I	
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		Ca III	
		Ca VII	
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		Ca X	
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		Ca XVII	24
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Californium	98	Cf I	46
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Carbon	6	C^{--}	13
		C$^-$	
		C I	
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		C V	
		C VI	

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		Ce III	
		Ce IV	
		Ce V	
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Cesium	55	Cs^-	39
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		Cs II	
Chlorine	17	Cl^-	20
		Cl I	21
		Cl II	
		Cl III	
		Cl IV	
		Cl V	
		Cl VI	
		Cl VII	
		Cl VIII	
		Cl IX	
		Cl X	
		Cl XI	
		Cl XII	
		Cl XIII	
		Cl XIV	
		Cl XV	
		Cl XVI	
		Cl XVII	
Chromium	24	Cr^-	26
		Cr I	
		Cr II	
		Cr III	
		Cr IV	
		Cr V	
		Cr VI	
		Cr VII	
		Cr VIII	
		Cr IX	
		Cr X	27
		Cr XI	
		Cr XII	
		Cr XIII	
		Cr XIV	
		Cr XV	
		Cr XVI	
		Cr XVII	
		Cr XVIII	
		Cr XIX	
		Cr XX	
		Cr XXI	
		Cr XXII	
		Cr XXIII	
		Cr XXIV	
Cobalt	27	Co I	30
		Co II	
		Co III	
		Co IV	
		Co X	
		Co XI	
		Co XII	
		Co XIII	
		Co XIV	
		Co XV	
		Co XVI	
		Co XVII	
		Co XVIII	
		Co XIX	
		Co XX	
		Co XXI	30
		Co XXII	
		Co XXIII	
Copper	29	Cu^-	31
		Cu I	
		Cu II	
		Cu III	
		Cu IV	
		Cu V	
		Cu VI	
		Cu XII	
		Cu XIII	
		Cu XIV	
		Cu XV	
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		Cu XVIII	32
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Fermium	100	Fm I	47
		Fm XCV	
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		Ga XII	
		Ga XIII	
		Ga XIV	
		Ga XV	
		Ga XVI	
		Ga XVII	
		Ga XVIII	
		Ga XIX	
		Ga XX	
		Ga XXI	
Germanium	32	Ge$^-$	33
		Ge I	
		Ge III	
		Ge IV	
		Ge V	
		Ge VI	
		Ge XIII	
		Ge XIV	
		Ge XV	
		Ge XVI	
		Ge XVII	
		Ge XVIII	
		Ge XIX	
		Ge XX	
		Ge XXI	
		Ge XXII	
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		Ge XXIV	
Gold	79	Au$^-$	44
		Au I	
		Au II	
		Au III	
		Au IV	
		Au	
Hafnium	72	Hf I	44
		Hf II	
		Hf IV	
		Hf V	
Helium	2	He$^-$	12
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		He II	
Holmium	67	Ho I	42
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		Ho III	
		Ho IV	
Hydrogen	1	H^{--}	12
		H$^-$	
		H I	
Indium	49	In$^-$	38
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		In III	
		In IV	
Iodine	53	I$^-$	39
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		I V	
		I VI	
		I VII	
		I VIII	
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		Fe III	
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		Fe VII	
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		Fe IX	
		Fe X	
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		Kr VIII	
		Kr IX	
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Lanthanum	57	La I	40
		La II	
		La III	
		La IV	
		La V	
Lawrencium	103	Lr I	47
Lead	82	Pb$^-$	45
		Pb I	
		Pb II	
		Pb III	
		Pb IV	
		Pb V	
Lithium	3	Li$^-$	12
		Li I	
		Li II	13
		Li III	
Lutetium	71	Lu I	44
		Lu II	
		Lu III	
		Lu IV	
		Lu V	
Magnesium	12	Mg$^-$	17
		Mg I	
		Mg II	
		Mg III	
		Mg IV	
		Mg V	
		Mg VI	
		Mg VII	
		Mg VIII	
		Mg IX	
		Mg X	
		Mg XI	18
		Mg XII	
Manganese	25	Mn I	27
		Mn II	
		Mn III	
		Mn IV	
		Mn VI	
		Mn VIII	
		Mn IX	
		Mn X	
		Mn XI	
		Mn XII	
		Mn XIII	
		Mn XIV	
		Mn XV	
		Mn XVI	28
		Mn XVII	
		Mn XVIII	
		Mn XIX	
		Mn XX	
		Mn XXI	
		Mn XXII	
		Mn XXIII	28
		Mn XXIV	
Mendelevium	101	Md I	47
Mercury	80	Hg$^-$	44
		Hg I	
		Hg II	45
		Hg LXXX	
Molybdenum	42	Mo I	37
		Mo VII	
		Mo VIII	
		Mo XV	
		Mo XXXIII	
		Mo XLI	
		Mo XLII	
Neodymium	60	Nd I	41
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		Nd III	
		Nd IV	
		Nd V	
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Neon	10	Ne$^-$	15
		Ne I	
		Ne II	16
		Ne III	
		Ne IV	
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		Ne VI	
		Ne VII	
		Ne VIII	
		Ne IX	
		Ne X	
		Ne	
Neptunium	93	Np I	46
		Np IV	
		Np V	
		Np VI	
		Np VII	
Nickel	28	Ni I	30
		Ni II	
		Ni III	
		Ni IV	
		Ni V	
		Ni VI	
		Ni VII	
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Nitrogen	7	N^{--}	14
		N^{-}	
		N I	
		N II	
		N III	
		N IV	
		N V	
		N VI	
		N VII	
Nobelium	102	No III	47
Osmium	76	Os I	44
Oxygen	8	O^{--}	14
		O^{-}	
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		O II	
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		O V	15
		O VI	
		O VII	
		O VIII	
Palladium	46	Pd I	37
		Pd X	
		Pd XI	
		Pd XII	
Phosphorus	15	P^{--}	19
		P^{-}	
		P I	
		P II	
		P III	
		P IV	
		P V	
		P VI	
		P VII	
		P VIII	
		P IX	
		P X	
		P XI	20
		P XII	
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		P XIV	
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Platinum	78	Pt^{-}	44
		Pt I	
		Pt II	
Plutonium	94	Pu I	46
		Pu II	
		Pu V	
		Pu VII	
Potassium	19	K^{-}	22
		K I	
		K II	
		K III	
		K IV	
		K V	23
		K VI	
		K VII	
		K VIII	
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		K X	
		K XI	
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Rhenium	75	Re VIII	44
Rhodium	45	Rh IX	37
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		Sc X	
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Silicon	14	Si^{--}	18
		Si$^-$	
		Si I	
		Si II	
		Si III	19
		Si IV	
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		Si VII	
		Si VIII	
		Si IX	
		Si X	
		Si XI	
		Si XII	
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		Na IV	
		Na V	
		Na VI	
		Na VIII	
		Na IX	
		Na X	
		Na XI	
Strontium	38	Sr I	36
		Sr II	
		Sr III	
		Sr IV	
		Sr V	
Sulfur	16	S^{--}	20
		S I	
		S II	
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Thorium	90	Th I	45
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		Ti IX	
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		Ti XIV	
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H^{-}	EL	1898, 2405, 2639, 3005, 3051, 3097
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	TE	1713
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	OT	1658, 1668, 1713, 1717, 1730, 1737, 1849, 1928, 2230, 2268, 2397, 2444, 2572A, 2920, 2921, 2952, 2999, 3084, 3106, 3163
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	IP	1426
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	OT	1395, 1396, 1826, 2606, 2712, 2735, 2784, 2822, 2836, 2854, 2997, 3107, 3162, 3164
He^{-}	EL	1393, 1424A, 1652A, 1784, 1818, 2010, 2028, 2219, 2524A, 2593, 2622, 2656, 2793, 2842, 3087, 3091, 3103, 3165
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	Hfs	1911A, 2028, 2656
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He I	EL	1311, 1341, 1362, 1391, 1460, 1489, 1550, 1752, 1784, 1786, 1788, 1934, 2010, 2012, 2135, 2219, 2325A, 2524A, 2652, 2710, 2711, 2738, 2793, 2858A, 2861A, 2949, 2969, 3021, 3026, 3087, 3089, 3091, 3155, 3160
	ND	1602
	CL	1362, 1532A, 1654, 1784, 1786, 1788, 1992, 2012, 2033, 2140, 2325A, 2710, 2853A, 3160
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	ZE	1311, 1364A, 1823, 2135, 2186, 2394, 2513A, 2565A, 3046, 3098, 3125
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	Hfs	1611, 1719, 1825, 1974, 2148A, 2737, 2746, 2757, 2860A
	QF	2194, 2239, 2971, 3155
	IP	2194
	TE	1713, 2194, 2238, 2281
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He II	EL	1362, 1383, 1496A, 1501A, 1506, 1518, 1521, 1522, 1549, 1901, 2508A, 3156, 3222
	CL	1362
	W	1362, 1383, 1901
	SE	2193
	Hfs	1506, 1719, 1825, 3053
	IS	1506
	QF	1330, 1340, 1392, 1496A, 1501A, 1521, 1829, 2036, 2089A, 2477, 2508A, 2974, 3222
	OT	1690A, 2756, 2833, 3016
Li^{-}	EL	2158A, 2296, 2551, 2671
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	OT	1723, 1838, 2256, 2633, 2801, 3060
Li I	EL	1362, 1393, 1560, 1565A, 1595A, 1614, 1704A, 1796, 1992, 2571A, 2764, 2818, 2985, 3034, 3062, 3160
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	Hfs	1689A, 1858A, 1944, 2090A, 2130, 2425, 2521A, 2729, 2737, 2788, 3155, 3158
	QF	2194, 2239, 2729, 2971, 3155
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Be I	EL	1790, 2031, 2041A, 2042A, 2301, 2305, 2311, 2771
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	W	1790, 2031, 2041A, 2042A, 2301, 2305, 2771
	ZE	2510A, 3080
	SE	1864
	Hfs	1700, 1859A, 2827, 3080
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Be II	EL	1790, 2031, 2041A, 2092A, 2212, 2301, 2305, 3034, 3080
	ND	1593
	CL	1593, 1790, 2031, 2041A, 2301, 2305, 2369, 3034
	W	1790, 2031, 2041A, 2301, 2305, 3034
	ZE	2510A, 3080
	Hfs	2510A, 3080
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Be III	EL	1653, 1673A, 1940, 2683
	CL	1653, 1673A, 1940, 2683
	W	1653, 1673A, 1940, 2493A, 2683
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	QF	2194, 2239, 2683
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	OT	1591, 1610, 2741, 3086, 3174
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	W	1790, 2041A, 2393, 3160
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	W	1893, 2393, 3034
	Hfs	2169A
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B IV	EL	1893, 2393, 2419, 2493A, 2558, 2782
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$\mathrm{N^{-}}$	AT	1320
N I	EL	1411, 1790, 1915A, 2172A, 2319, 2430
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	W	1578, 2448A, 2580
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	ZE	1828, 2443, 2445
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	W	1675A, 1970, 2226
	ZE	2443, 2445
	AT	1320, 1534A, 1728
	OT	1481, 1728, 2106, 2868
O IV	EL	2215, 3234
	ND	3234
	CL	2215, 2517A, 3234
	W	2215, 2226, 2517A, 3234
	ZE	2443
	IP	3234

O IV—Continued		
	PT	2482A
	AT	1320, 1534A
O V	EL	1808, 2215, 3170, 3234
	CL	1808, 2215, 2517A, 3170, 3234
	W	1808, 2215, 2226, 2517A, 3170, 3234
	AT	1534A, 2995
	OT	2184, 2509, 2726, 3116, 3147
O VI	EL	1662, 1714, 2201, 2215, 2216, 2267, 2864A, 2902, 3065, 3082, 3170, 3234
	CL	1662, 1714, 2185, 2201, 2215, 2216, 2267, 2517A, 2864A, 2902, 3082, 3170, 3234
	W	1662, 2185, 2201, 2215, 2216, 2267, 2517A, 2864A, 2902, 3082, 3170, 3234
	AT	1534A
	OT	1714, 1844, 1977, 1993, 2214, 2986, 3111
O VII	EL	1343, 1909A, 2017, 2201, 2216, 2267, 2288, 2861A, 2902, 2945, 3170, 3234
	CL	1343, 1625, 1909A, 2017, 2185, 2201, 2216, 2267, 2288, 2517A, 2545, 2902, 2945, 3170, 3234
	W	1343, 1459, 1474, 1625, 1909A, 2017, 2185, 2201, 2216, 2267, 2288, 2517A, 2636, 2669, 2902, 2945, 3082, 3170, 3234
	QF	2194, 2426
	IP	2194, 2288
	TE	2194
	AT	2194, 2547, 2989
	OT	1726, 1844, 1977, 2545
O VIII	EL	1910A, 2173A, 2216, 2267, 2945, 3170
	CL	2216, 2267, 2517A, 2945, 3170
	W	1910A, 2150, 2216, 2267, 2517A, 2636, 2786, 2945, 3170
	QF	1722, 1824
F^-	EL	1455, 2401
	CL	2401
	W	2401
	AT	1320, 1753A
	OT	1802, 2659
F I	EL	2401, 2597
	ND	1899, 2597
	CL	2401, 3057
	W	2401, 3057
	ZE	2597, 3057
	Hfs	1842, 2062A, 2707
	PT	1899, 2597, 2598
	AT	1320, 1425A, 1960, 2004, 2597, 2598
	OT	1610, 1851
F II	PT	2597
	AT	1320, 2004, 2597
F III	EL	1331
	CL	1331
	W	1331
	AT	1320
F IV	EL	1672A, 2986
	CL	1672A, 2986
	W	1672A, 2986
	AT	1320, 1728, 2821
	OT	1481, 1728
F V	EL	1331, 2215, 2986
	CL	1331, 2215, 2986
	W	1331, 2215, 2986
	AT	1320
F VI	EL	1331, 2215, 2986
	CL	1331, 2215, 2986
	W	1331, 2215, 2986
	AT	2995
	OT	2726
F VII	EL	1331, 1714, 2215, 2288, 2543, 2670, 2694, 2714, 2864A, 2902, 3082
	CL	1331, 1714, 2215, 2288, 2543, 2670, 2694, 2714, 2807, 2864A, 2902, 3082
	W	1331, 2215, 2288, 2543, 2670, 2694, 2714, 2807, 2864A, 2902, 2986, 3082
	OT	1714, 2214, 2986, 3111
F VIII	EL	1343, 2266, 2288, 2326A, 2543, 2668, 2670, 2694, 2714, 2902
	CL	1343, 2266, 2288, 2326A, 2543, 2668, 2670, 2694, 2714, 2902
	W	1343, 2266, 2288, 2326A, 2543, 2668, 2670, 2694, 2714, 2902, 3082
	QF	2194, 2426
	IP	2194, 2288
	TE	2194
	AT	2194, 2547
	OT	1726
F IX	EL	2173A, 2543, 2670, 2714
	CL	2543, 2670, 2714
	W	2150, 2543, 2670, 2714
	ZE	2026
	QF	2529A
F X	EL	2173A
Ne^-	EL	1724, 2219, 2701
	CL	1724
	W	1724, 2219
	AT	1803
	OT	2275
Ne I	EL	1407, 1724, 1752, 1784, 1788, 1819, 2219, 2259, 2329A, 2749, 2750, 2796, 3120
	ND	2599

Ne I—Continued		
	CL	1724, 1784, 1788, 1819, 1975, 2219, 2228, 2259
	W	1407, 1724, 1752, 1784, 1788, 1819, 1975, 2219, 2259, 2637, 2852A, 2901, 3225, 3230, 3232
	ZE	1805, 1951, 2077A, 2624
	SE	2802, 2976
	Hfs	1589, 2013, 2077A, 2082A, 2272, 2435, 3012, 3022
	IS	1361, 1372, 1375, 1377, 1450, 1452, 1453, 1454, 1547, 1589, 1701A, 1900, 2013, 2023, 2082A, 2414, 2435, 2675, 2713, 3102
	IP	1407
	PT	1985, 2599, 2653
	AT	1320, 1321, 1448, 1605, 1683A, 1803, 1868, 1968, 1991, 2125, 2599, 2620, 2792, 2823, 2896, 2930, 3036, 3135
	OT	1610, 1834, 1841, 1968, 2008, 2313, 2432, 2550, 2672, 2823, 2904, 2978, 3101, 3129
Ne II	EL	1369A, 1406, 1502A, 1966A, 2329A, 2597, 2615, 2616, 2810, 2834, 2881, 2939, 2953
	ND	1406, 1899, 2597, 2598
	CL	1406, 1502A, 2615, 2616, 2939, 2953
	W	1369A, 1406, 1502A, 2615, 2616, 2637, 2939, 2953
	ZE	1359, 2597, 3157
	IS	1369A, 2589
	IP	1369A, 1406
	PT	1899, 2597, 2598
	AT	1320, 1809, 2257, 2597, 2598, 2948
	OT	2841
Ne III	EL	1406, 2303, 2317, 2329A, 2834, 2881, 2939, 2953
	CL	1406, 2303, 2317, 2939, 2953
	W	1406, 2303, 2317, 2939, 2953
	ZE	1359, 3157
	PT	2597
	AT	1320, 2257, 2597, 2948
	OT	2841
Ne IV	EL	2303, 2310, 2329A, 2677, 2834, 2881, 2939, 2953
	ND	2677
	CL	2303, 2310, 2677, 2939, 2953
	W	2303, 2310, 2677, 2939, 2953
	AT	1320, 2257
	OT	1619
Ne V	EL	2009, 2303, 2310, 2329A, 2678, 2834, 2881, 2916, 2939, 2953
	CL	1760, 2009, 2303, 2310, 2678, 2939, 2953
	W	1760, 2009, 2303, 2310, 2678, 2939, 2953
	AT	1320, 1728, 2257
	OT	1481, 1728
Ne VI	EL	1575, 2303, 2310, 2678, 2834, 2881, 2916, 2939, 2953
	CL	1575, 1760, 2303, 2310, 2678, 2939, 2953
	W	1575, 1760, 2303, 2310, 2678, 2939, 2953
	ZE	3157
	AT	1320, 1327, 2257
Ne VII	EL	1808, 2303, 2310, 2481, 2834, 2881, 2916, 2939, 2953, 3170
	CL	1721, 1760, 1775, 1808, 2122, 2227, 2303, 2310, 2481, 2939, 2953, 3170
	W	1721, 1760, 1775, 1808, 2009, 2122, 2227, 2303, 2310, 2481, 2939, 2953, 3170
	AT	2257
	OT	2509
Ne VIII	EL	1313, 1650, 1808, 1822, 1845, 2176A, 2177A, 2303, 2407, 2604, 2834, 2881, 2916, 2939, 2953, 3082, 3170
	CL	1313, 1650, 1721, 1760, 1808, 1822, 1845, 2122, 2185, 2227, 2303, 2407, 2522A, 2604, 2939, 2953, 3082, 3170
	W	1313, 1650, 1721, 1760, 1808, 1822, 1845, 2122, 2185, 2227, 2303, 2407, 2522A, 2604, 2939, 2953, 3082, 3170
	AT	2257
	OT	1808, 1844, 1977, 2120
Ne IX	EL	1343, 1845, 2176A, 2177A, 2303, 2407, 2834, 2881, 2916, 2953, 3170
	CL	1343, 1845, 2185, 2303, 2407, 2522A, 2545, 2953, 3170
	W	1343, 1845, 2185, 2303, 2407, 2522A, 2636, 2786, 2953, 3082, 3170
	QF	2194, 2426
	IP	1845, 2194
	TE	2194
	AT	2194, 2257, 2547, 2989
	OT	1726, 1844, 1977, 1980, 2120, 2545
Ne X	EL	2303, 2407, 2916, 3170
	CL	2303, 2407, 3170
	W	2303, 2407, 2786, 3170
	AT	2257
Ne	W	2306, 2308
Na⁻	EL	1749A, 2158A, 2296, 2551, 2671
	AT	1439
	OT	2157A, 2241, 2530A, 2633, 2801, 3060
Na I	EL	1795, 2018, 2384, 2571A, 2584, 2600, 2661, 2764, 2855A, 2865A, 2870, 2871, 2981, 3008, 3018, 3025, 3073
	CL	1795, 2018, 2309, 2369, 2382, 2571A, 2865A, 3018
	W	1795, 2018, 2382, 2571A, 2600, 2865A, 3018

Na I—Continued		
	ZE	1367, 2160A, 2789, 2859A, 3223
	SE	1513, 1590, 1787, 2202, 2814, 2855A, 3001, 3015, 3025
	Hfs	1367, 1535, 1567, 1709A, 1710A, 1761, 1913A, 1929, 1956, 2001, 2060A, 2080, 2093A, 2094A, 2096A, 2097A, 2164A, 2204, 2282, 2337A, 2339A, 2384, 2436, 2472, 2490, 2507A, 2523A, 2588, 2600, 2650, 2689A, 2789, 2803, 2804, 2845A, 2859A, 2870, 2871, 2914, 3083, 3096, 3119, 3137
	IS	3096
	QF	2163A
	IP	2018
	AT	1836, 1971, 2731, 2912, 2950, 2962
	OT	1456, 1573, 1742, 1834, 1918, 1971, 2117, 2410, 2972, 3220
Na II	ZE	1691A
	Hfs	2511A
	PT	2599
	AT	1683A, 2273, 2599
	OT	1841, 3129
Na III	EL	1660, 1882, 1883, 2484A, 2909
	ND	1660, 1882, 1899, 2909
	CL	1882, 1883, 2484A, 2909
	W	1882, 1883, 2484A, 2909
	IP	2720, 2909
	PT	1882, 1899, 2598, 2909
	AT	2598
	OT	1883, 2720
Na IV	EL	2109, 2484A, 2617
	CL	2109, 2387, 2484A, 2617
	W	2109, 2387, 2484A, 2617
Na V	EL	2109
	CL	2109
	W	2109
Na VI	EL	1331, 2109, 2142, 2617
	CL	1331, 2109, 2617
	W	1331, 2109, 2617
	PT	2142
	OT	1481
Na VIII	EL	1808
	CL	1808
	W	1808
Na IX	EL	1331, 1808, 2560, 2743
	CL	1331, 1808, 2560, 2743
	W	1331, 1808, 2560, 2743
	OT	1808
Na X	EL	2328A, 2560, 2743
	CL	2328A, 2560, 2743
	W	2328A, 2560, 2743
Na XI	EL	2304, 2328A, 2560
	CL	2304, 2328A, 2560
	W	2304, 2328A, 2560
Mg^-	EL	2983
Mg I	EL	1790, 2098A, 2195, 2781, 2926, 3130, 3166
	ND	2030
	CL	1790, 2030, 2098A, 2195, 2309, 2369, 2781, 2926, 3130, 3166
	W	1790, 2098A, 2195, 2781, 2926, 3130, 3166
	Hfs	2515
	IS	1688A
	IP	2195, 2374, 2874, 3166
	AT	1449, 1572, 1626, 2016, 2030, 2688, 2730, 2769, 2872, 2873
	OT	1572, 1834, 2037, 2117, 2156A, 2290, 3161
Mg II	EL	1790, 2781, 2857A, 3130
	CL	1790, 2369, 2781, 3130
	W	1790, 2781, 3130
	AT	1836, 1971, 2872, 2873
	OT	1573, 1971, 2037
Mg III	EL	1434, 2003, 2781, 3130
	ND	1434, 2149
	CL	1434, 2003, 2781, 3130
	W	1434, 2003, 2781, 3130
	IP	1434, 2003
	PT	1434, 2149, 2599
	AT	1683A, 2599
	OT	3129
Mg IV	EL	1660, 1965, 2720
	ND	1660, 1899, 1959, 1965
	CL	1660, 1959, 1965, 2720
	W	1660, 1965, 2720
	IP	1660, 1965, 2720
	PT	1660, 1899, 1959, 1965, 2598, 2720
	AT	1660, 1959, 2039A, 2598, 2720
Mg V	EL	1965, 2877
	CL	2277, 2877
	W	1965, 2277, 2877
Mg VI	OT	1619
Mg VII	EL	1331
	CL	1331
	W	1331, 1459
	OT	1481
Mg VIII	W	1428
Mg IX	EL	1808, 2481
	CL	1808, 2009, 2481
	W	1808, 2009, 2481
Mg X	EL	1331, 1808, 2304, 2408, 2479, 2560, 2670, 2728, 2743
	CL	1331, 1808, 2304, 2408, 2479, 2560, 2670, 2728, 2743

Mg x—Continued	W	1331, 1428, 1808, 2304, 2408, 2479, 2560, 2636, 2670, 2728, 2743
	TE	2934
	OT	1808, 1844, 1977, 2479, 2934
Mg xi	EL	1428, 1585, 2304, 2328A, 2408, 2479, 2560, 2602, 2670, 2743, 3123, 3226
	CL	1428, 1585, 2304, 2328A, 2408, 2479, 2545, 2560, 2602, 2670, 2743, 3123, 3226
	W	1428, 1585, 2304, 2328A, 2408, 2479, 2560, 2602, 2636, 2670, 2743, 3123, 3226
	AT	2989
	OT	1428, 1844, 1977, 2479, 2545
Mg xii	EL	2304, 2328A, 2408, 2479, 2560, 2602, 2670, 3226
	CL	2304, 2328A, 2408, 2479, 2560, 2602, 2670, 3226
	W	1428, 2304, 2328A, 2408, 2479, 2560, 2602, 2636, 2670, 3226
	OT	2479
Al$^-$	EL	3103
Al i	EL	1790, 2628
	ND	2293
	CL	1790, 2309, 2369, 2628
	W	1790, 2628, 2685
	SE	2395
	Hfs	1746, 2062A, 2395, 2707
	AT	1971, 2293, 3076
	OT	1834, 1971, 2293, 3076
Al ii	EL	1790, 2134A, 2940
	ND	1523A, 2293
	CL	1523A, 1790, 2134A, 2369, 2940
	W	1790, 2134A, 2940
	IP	2134A
	AT	1572, 2293
	OT	1572, 2290
Al iii	EL	2940
	CL	2940
	W	2940
	AT	1836, 1971
	OT	1573, 1971
Al iv	EL	1607, 1674A, 1963, 2223, 2829, 2940
	ND	1963, 2223, 2829
	CL	1607, 1674A, 1963, 2223, 2829, 2940
	W	1607, 1674A, 1963, 2223, 2605, 2829, 2940
	IP	2829
	PT	1963, 2223, 2829
	AT	1491, 1963
	OT	3129
Al v	EL	1660, 2577, 2940
	ND	1630, 1660, 2181, 2577
	CL	1630, 2577, 2940
	W	1630, 2577, 2605, 2940
Al v—Continued	PT	2577
	AT	2577
Al vi	EL	2877, 2940
	CL	1785, 2277, 2877, 2940
	W	1785, 2277, 2605, 2877, 2940
Al vii	EL	2940
	CL	1785, 2587, 2940
	W	1785, 2587, 2605, 2940
Al viii	EL	1331
	CL	1331, 1785
	W	1331, 1785, 2605
	OT	1481
Al ix	EL	1471
	ND	1471
	CL	1471, 1484, 1785
	W	1471, 1484, 1785
	AT	1327
Al x	EL	1331, 1471, 1808
	CL	1331, 1471, 1785, 1808
	W	1331, 1471, 1785, 1808
Al xi	EL	1331, 1471, 2081A, 2304, 2408, 2479, 2560, 2670, 2743, 2946
	CL	1331, 1471, 1484, 2304, 2408, 2479, 2560, 2670, 2743
	W	1331, 1471, 1484, 2304, 2408, 2479, 2560, 2670, 2743
	OT	1808, 2479
Al xii	EL	2304, 2328A, 2408, 2479, 2560, 2670, 2743, 3123, 3226
	CL	2304, 2328A, 2408, 2460, 2479, 2560, 2670, 2743, 3123, 3226
	W	1428, 2304, 2328A, 2408, 2460, 2479, 2560, 2636, 2670, 2743, 3123, 3226
	OT	2479
Al xiii	EL	2304, 2328A, 2408, 2479, 2560, 3226
	CL	2304, 2328A, 2408, 2460, 2479, 2560, 3226
	W	1428, 2304, 2328A, 2408, 2460, 2479, 2560, 2636, 3226
	OT	2479
Si^{--}	AT	2199
Si$^-$	EL	2897, 3103
Si i	EL	1790, 2167, 2533A, 2542
	CL	1790, 2167, 2309, 2369, 2533A, 2542
	W	1459, 1790, 2533A, 2542
	IP	2167, 2542
	PT	2733
	AT	2968
	OT	2167
Si ii	CL	2369, 2645
	W	2226
	AT	1971
	OT	1971

Si III	W	2226
	AT	1572
	OT	1572
Si IV	W	2226
	OT	1731, 2129
Si V	ND	2223
	TE	2843
	AT	1491
	OT	2843, 3129
Si VI	ND	1660, 2181
	AT	2004
Si VII	EL	1334, 2877
	CL	1334, 2277, 2877
	W	1334, 1459, 2277, 2877
	AT	2004
Si VIII	EL	2728
	CL	2728
	W	1459, 2728
	AT	2004
	OT	1619
Si IX	EL	1331, 1334, 2479
	ND	1334
	CL	1331, 1334, 2479
	W	1331, 1334, 1428, 1459, 2479
	AT	2004
	OT	2106, 2479
Si X	EL	2479
	CL	2479
	W	1428, 2479, 2636
	AT	1327, 2004
	OT	2106, 2479
Si XI	EL	1331, 1808, 2479, 2481
	CL	1331, 1808, 2479, 2481
	W	1331, 1808, 2479, 2481
	AT	2004
	OT	2479
Si XII	EL	1331, 1808, 2081A, 2304, 2479, 2560, 2728, 2743, 2863A, 2946
	CL	1331, 1808, 2304, 2479, 2560, 2728, 2743, 2863A
	W	1331, 1428, 1808, 2304, 2479, 2560, 2728, 2743, 2863A
	TE	2934
	AT	2989
	OT	1808, 1844, 2479, 2934
Si XIII	EL	1428, 1592, 2304, 2328A, 2479, 2560, 2722, 2743
	CL	1428, 2285, 2304, 2328A, 2479, 2545, 2560, 2743
	W	1428, 2304, 2328A, 2479, 2560, 2636, 2743
	TE	2285
	OT	1428, 1844, 2285, 2479, 2545, 2748
Si XIV	EL	2304, 2328A, 2479, 2560
	CL	2304, 2328A, 2479, 2560
	W	1428, 2304, 2328A, 2479, 2560, 2636
	OT	2479
Si XV	EL	2479
	CL	2479
	W	2479
	OT	2479
Si XVIII	EL	1334
	CL	1334
	W	1334
P--	AT	2199
P-	EL	2296
P I	CL	2309, 2369, 2548
	W	2548
	Hfs	2709
	AT	2459A
P II	EL	1778
	ND	1778
	CL	1778, 2369
	W	1778
	ZE	1778
	PT	1778, 2733
	AT	1777
P III	EL	2608
	CL	2608
	W	2608
	AT	1971
	OT	1971
P IV	EL	1558, 2608, 3055
	ND	1558
	CL	1508, 2608, 3055
	W	1508, 2608, 3055
	IP	1558
P V	EL	2608, 2613
	CL	2608, 2613
	W	2608, 2613
	IP	2613
	SF	2613
P VI	ND	2223
	AT	1491
	OT	3129
P VII	ND	1660, 2181
P VIII	EL	2299, 2877
	CL	2277, 2299, 2877
	W	2277, 2299, 2877
P IX	EL	2299
	CL	2299
	W	2299
P X	EL	1334, 2279, 2299
	ND	1334
	CL	1334, 2279, 2299
	W	1334, 2279, 2299

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P XI	EL	2279, 2299
	CL	2279, 2299
	W	2279, 2299
P XII	EL	1924, 2279, 2299
	CL	1924, 2279, 2299
	W	1924, 2279, 2299
	IP	1924
	OT	1680, 1924, 3136
P XIII	EL	1924, 2299, 2560
	ND	1924
	CL	1924, 2299, 2560
	W	1924, 2299, 2560
	OT	1808, 1924
P XIV	EL	2560, 3123
	CL	2560, 3123
	W	2560, 3123
P XV	EL	2560
	CL	2560
	W	2560
S^{--}	AT	2199
S I	EL	1500, 1982
	ND	2043A
	CL	1500, 2309, 2369, 2645
	W	1500, 1982
	ZE	1817
	IP	1500
	PT	2192
	AT	2043A, 2126, 2459A
	OT	2126
S II	CL	1927
	W	1927, 2226, 2514A
	PT	2192
S III	CL	1927, 2645
	W	1927, 2226, 2514A
	PT	2733
S IV	EL	1329
	CL	1329, 1927
	W	1329, 1927, 2226, 2514A
S V	EL	1329, 2514A, 3055
	CL	1329, 1927, 2127, 2514A, 3055
	W	1329, 1927, 2226, 2514A, 3055
	IP	1558
	OT	2290
S VI	EL	1329, 2514A
	CL	1329, 2514A
	W	1329, 1927, 2226, 2514A
S VII	ND	1483
	TE	2843
	AT	1491
	OT	1745, 2843
S VIII	EL	1660, 2577
	ND	1660, 2181
S VIII—Continued	CL	2577
	AT	2039A
S IX	EL	1347, 2321, 2877
	ND	1334
	CL	1334, 1347, 2277, 2321, 2877
	W	1334, 1347, 1459, 2277, 2321, 2877
	AT	1555, 2321
S X	EL	1334, 1347, 2279, 2321, 2728
	CL	1334, 1347, 2279, 2321, 2728
	W	1334, 1347, 2279, 2321, 2728
	AT	1555, 2321
S XI	EL	1334, 1347, 2279
	ND	1334
	CL	1334, 1347, 2279
	W	1334, 1347, 1459, 2279
	AT	1555
	OT	1481
S XII	EL	1334, 1347, 2279, 2479
	CL	1334, 1347, 2279, 2479
	W	1334, 1347, 1428, 2279, 2479
	TE	2934
	AT	1327, 1555
	OT	2479, 2934
S XIII	EL	1347, 1808, 2279, 2315, 2479, 2481
	CL	1347, 1808, 2279, 2315, 2479, 2481
	W	1347, 1428, 1808, 2279, 2315, 2479, 2481
	OT	2479, 3136
S XIV	EL	1808, 2168A, 2279, 2304, 2315, 2330A, 2404, 2421, 2479, 2560, 2728, 2743
	CL	1808, 2279, 2304, 2315, 2421, 2479, 2560, 2728, 2743
	W	1428, 1808, 2279, 2304, 2315, 2421, 2479, 2560, 2728, 2743
	TE	2934
	OT	1808, 1844, 1977, 2479, 2934, 3111
S XV	EL	1428, 1592, 2174A, 2304, 2330A, 2421, 2479, 2560, 2722, 3123
	CL	1428, 2304, 2421, 2479, 2545, 2560, 3123
	W	1428, 2304, 2421, 2479, 2560, 3123
	OT	1428, 1844, 1977, 2479, 2545
S XVI	EL	2304, 2479, 2560
	CL	1462, 2304, 2479, 2560
	W	1428, 1462, 2304, 2479, 2560
	SE	3121
	OT	2479
Cl^{-}	EL	2205
	ND	2206
	CL	2205
	W	2205
	AT	1516
	OT	1802, 2206, 2659

Cl I	EL	2069, 2379
	ND	2043A
	CL	1505, 2069
	W	1505, 2069
	ZE	2734
	SE	1490
	Hfs	2062A, 2707, 2734
	AT	2043A, 2459A, 2475, 2820
Cl II	EL	1617, 2043A, 2940
	ND	1617, 2043A
	CL	1617, 2043A, 2940
	W	1617, 2043A, 2940
	SE	1490
	IP	1617
	PT	1617, 2043A
	AT	1617, 2043A
Cl III	EL	2940
	CL	2940
	W	2940
Cl IV	EL	1401, 2258, 2940
	CL	1401, 2258, 2645, 2940
	W	1401, 2258, 2940
	PT	2733
Cl V	EL	1401, 2258, 2940
	CL	1401, 2258, 2940
	W	1401, 2940
Cl VI	EL	1401, 2258, 2267, 2940
	CL	1401, 1941, 2258, 2267, 2381, 2940
	W	1401, 2258, 2267, 2381, 2940
	IP	1558, 2381
Cl VII	EL	1401, 2258, 2267, 2863A, 2940
	CL	1401, 2258, 2267, 2381, 2863A, 2940
	W	1401, 2258, 2267, 2381, 2666, 2667, 2863A, 2940
	IP	2381
Cl VIII	EL	2258, 2267, 2940
	CL	2258, 2267, 2940
	W	2258, 2267, 2381, 2940
	AT	1491
	OT	1745
Cl IX	EL	2258, 2267, 2577, 2940
	ND	2181
	CL	2258, 2267, 2577, 2940
	W	2258, 2267, 2381, 2940
Cl X	EL	2183, 2258, 2267
	ND	1334
	CL	1334, 2183, 2258, 2267
	W	1334, 2183, 2258, 2267
Cl XI	EL	1334, 2267, 2279
	CL	1334, 2267, 2279
	W	1334, 2267, 2279
Cl XII	EL	1334, 1481, 2267, 2279, 3105
	ND	1334
Cl XII—Continued	CL	1334, 1481, 2267, 2279, 3105
	W	1334, 1481, 2267, 2279, 3105
	OT	1481
Cl XIII	EL	1334, 2267, 2279, 3105
	CL	1334, 2267, 2279, 3105
	W	1334, 2267, 2279, 3105
Cl XIV	EL	1334, 2267, 2279, 3105
	CL	1334, 2267, 2279, 3105
	W	1334, 2267, 2279, 3105
	OT	3136
Cl XV	EL	1642, 2330A, 2398, 2560, 2667, 2818, 3105, 3169
	CL	2398, 2560, 2667, 3105, 3169
	W	2398, 2560, 2667, 3105, 3169
	OT	1642, 1808, 2215, 3111
Cl XVI	EL	2330A, 2398, 2446, 2560, 3105, 3169
	CL	2398, 2446, 2560, 3105, 3169
	W	2398, 2446, 2560, 3105, 3169
Cl XVII	EL	3105
	CL	3105
	W	3105
Ar$^-$	EL	1495, 2219, 2405, 2576, 2701, 3031
	CL	2405
	W	2219, 2405
	AT	2556
Ar I	EL	1495, 1788, 1819, 1827, 2057A, 2131, 2162A, 2219, 2244, 2228, 2325A, 2427, 2429, 2576, 2578, 2634, 2640, 2749, 3031, 3236
	ND	2899
	CL	1788, 1819, 1827, 2145, 2219, 2244, 2325A, 2427, 2429, 2634, 2958, 3236
	W	1788, 1819, 1827, 2057A, 2131, 2219, 2244, 2325A, 2427, 2429, 2578, 2634, 3236
	ZE	1708A, 2121, 2644
	IP	2131
	PT	1319, 1985, 2191, 2599
	AT	1516, 1605, 1837, 1865, 1978, 1991, 2153A, 2274, 2599, 2620, 2736, 2823, 2899, 2908, 3182A
	OT	2213, 2399, 2427, 2823, 2899, 2904, 2908, 2910
Ar II	EL	1317, 1845, 2057A, 2162A, 2634, 3236
	ND	1794
	CL	1845, 2145, 2634, 2958, 3236
	W	1317, 1845, 2057A, 2634, 3236
	ZE	1525, 1588, 1833
	PT	1509, 1794
	AT	2740
Ar III	EL	1328, 2727, 2998
	CL	1328, 2145, 2727, 2958

Ar III—Continued		
	W	1328, 2727
	ZE	1525, 1588
	AT	2740
Ar IV	EL	1328, 2727, 2998
	CL	1328, 2145, 2727, 2958
	W	1328, 2727
Ar V	EL	3055
	CL	3055
	W	3055
	PT	2733
Ar VI	EL	3055
	CL	3055
	W	3055
Ar VII	EL	3055, 3236
	CL	3055, 3236
	W	2885A, 3055, 3236
	IP	1558
	OT	2290
Ar VIII	EL	1650
	CL	1458, 1650
	W	1458, 1650, 2885A
	OT	1731
Ar IX	EL	1845
	CL	1845, 2143
	W	1845, 2885A
	TE	2843
	AT	1491
	OT	2843
Ar X	EL	1334, 3221
	CL	1334, 2143, 3221
	W	1334, 2885A, 3221
	OT	2181
Ar XI	EL	1334, 3221
	CL	1334, 2029, 2754, 3221
	W	1334, 2885A, 3221
	AT	2029
Ar XII	EL	1334, 1845, 2279, 3221, 3236
	CL	1334, 1845, 2279, 3221, 3236
	W	1334, 1845, 2279, 3221, 3236
Ar XIII	EL	1334, 1481, 2279, 3221
	CL	1334, 1481, 2279, 3221
	W	1334, 1428, 1481, 2279, 3221
	OT	1481
Ar XIV	EL	1334, 1845, 2479, 3221
	CL	1334, 1845, 2479, 3221
	W	1334, 1428, 1845, 2479, 3221
	AT	1327
	OT	2479
Ar XV	EL	1334, 1808, 1845, 2479, 2481, 3221
	CL	1334, 1808, 1845, 2479, 2481, 3221

Ar XV—Continued		
	W	1334, 1428, 1808, 1845, 2479, 2481, 3221
	OT	2479, 3136
Ar XVI	EL	1642, 1808, 1845, 2304, 2331A, 2479, 2728, 2818
	CL	1808, 1845, 2304, 2331A, 2479, 2728
	W	1428, 1808, 1845, 2304, 2331A, 2479, 2728
	TE	2934
	OT	1642, 1808, 1844, 1977, 2215, 2479, 2934, 3111
Ar XVII	EL	1428, 1592, 1845, 2304, 2479, 2618, 2722, 2815
	CL	1428, 1845, 2304, 2479, 2545, 2815
	W	1428, 1845, 2304, 2479, 2815
	IP	1845
	OT	1428, 1494, 1844, 1977, 2479, 2545
Ar XVIII	EL	1845, 2479, 2722
	CL	1462, 1845, 2479
	W	1462, 1845, 2479
	OT	2479
Ar XIX	W	1428
Ar	W	1334, 3055
K^-	EL	2158A, 2296, 2671, 3218
	OT	2157A, 2633, 3060
K I	EL	1792, 2152A, 2996, 3069, 3131, 3183, 3218, 3219
	CL	1792, 2309, 2369, 2996, 3131, 3183, 3219, 3227
	W	1427, 1792, 1906A, 2996, 3131, 3183, 3219, 3227
	ZE	1747A, 1810, 2789
	SE	1418, 1590, 2202, 3001
	Hfs	1416, 1682A, 1703A, 1707A, 1748A, 1763, 1876, 1913A, 1961, 2001, 2203, 2254, 2505A, 2744, 2789, 2819, 2845A, 3137
	IS	1315
	IP	3131
	AT	2731, 2962
	OT	1456, 1742, 2332A, 2809, 3024
K II	EL	2857A, 2940
	ND	2191, 2760
	CL	2940
	W	2940
	PT	2191, 2599, 2760, 2933
	AT	1516, 1665, 1837, 2409, 2599, 2760
	OT	2809
K III	EL	2940
	CL	2940
	W	2940
K IV	EL	2940
	CL	2940
	W	2940

K V	EL	2940
	CL	2940
	W	2940
K VI	EL	2940
	CL	2940
	W	2940
	PT	2733
K VII	EL	2940
	CL	2940
	W	2940
K VIII	EL	1558, 2940
	CL	1558, 2940
	W	1558, 2940
	IP	1558
	OT	1467
K IX	EL	2940
	CL	2940
	W	2940
K X	AT	1491
K XI	EL	2039A, 2181
	CL	2039A, 2181
	W	2039A, 2181
	AT	2039A
K XII	EL	2183, 2563, 2877
	CL	2183, 2277, 2563, 2877
	W	2183, 2277, 2563, 2877
K XIII	EL	2563
	CL	2563
	W	2563
K XIV	EL	2076, 2563
	CL	2563
	W	2563
K XV	EL	2076, 2563
	CL	2563
	W	2563
K XVI	EL	2563
	CL	2563
	W	2563
	OT	3136
K XVII	EL	1808, 1816, 2560, 3169
	CL	1808, 1816, 2560, 3169
	W	1808, 1816, 2560, 3169
	IP	1816
	OT	1808, 1816
K XVIII	EL	2479, 2560, 3169
	CL	2479, 2560, 3169
	W	2479, 2560, 3169
	OT	2479
Ca⁻	EL	1687
Ca I	EL	2182
	CL	2182, 2309, 2369
Ca I—Continued		
	W	2182
	ZE	2307, 2689A
	SE	2307
	Hfs	2515
	IS	1322
	IP	2182, 2374, 2874
	PT	2808
	AT	1566, 1626, 1804, 2459A, 3076
	OT	3076, 3220
Ca II	CL	2309, 2369
Ca III	EL	1405, 2911
	ND	2191, 2911
	CL	1405, 2911
	W	1405, 2911
	IP	1405
	SF	1405
	PT	1405, 1837, 2191, 2599, 2911
	AT	1665, 1837, 2599, 2911
Ca VII	PT	2733
Ca IX	EL	1558
	CL	1558
	W	1558
	IP	1558
Ca X	CL	1458
	W	1458
Ca XI	TE	2843
	AT	1491
	OT	2843
Ca XII	EL	2039A, 2181
	CL	2039A, 2181
	W	2039A, 2181
	OT	3104
Ca XIII	EL	1333, 2183, 2563, 2877
	ND	2563
	CL	1333, 2183, 2277, 2563, 2877
	W	1333, 2183, 2277, 2563, 2877
	OT	3104
Ca XIV	EL	1333, 2563, 3043
	ND	2563
	CL	1333, 2563, 3043
	W	1333, 2563, 3043
	PT	3043
Ca XV	EL	1333, 1808, 2076, 2563, 3043
	ND	2563
	CL	1333, 1808, 2563, 3043
	W	1333, 1808, 2563, 3043
	AT	1728
	OT	1728, 1808, 3104
Ca XVI	EL	1808, 2479, 2076, 2563, 3043
	CL	1808, 2479, 2563, 3043
	W	1428, 1808, 2479, 2563, 3043
	OT	1808, 2479

Ca XVII	EL	1808, 2479, 2481, 2487A, 2563, 3043, 3136
	CL	1808, 2479, 2481, 2487A, 2563, 3043, 3136
	W	1428, 1808, 2479, 2481, 2487A, 2563, 3043, 3136
	OT	2479, 3136
Ca XVIII	EL	1808, 1816, 2479, 2560, 2728, 3169
	CL	1808, 1816, 2479, 2560, 2728, 3169
	W	1428, 1808, 1816, 2479, 2560, 2728, 3169
	IP	1816
	TE	2934
	OT	1808, 1816, 1844, 1977, 2479, 2934
Ca XIX	EL	1428, 2479, 2560, 3169
	CL	1428, 2285, 2479, 2545, 2560, 3169
	W	1428, 2479, 2560, 3169
	TE	2285
	OT	1428, 1844, 1977, 2285, 2479, 2545, 2748
Ca XX	EL	2479
	CL	2479
	W	1428, 2479
	OT	2479
Sc I	EL	1473, 2110, 3140
	ND	2032
	CL	1473, 2110
	W	1473, 2110
	ZE	1380, 1473, 3140
	Hfs	1380, 2032, 2066A, 2708, 3066
	IP	1473, 2110
	AT	1983, 2423
	OT	1983
Sc II	EL	1473
	CL	1473, 1608
	W	1473, 1608
	ZE	1473
Sc III	EL	1884, 1891, 2123, 2625
	CL	1608, 1884, 1891, 2123, 2625
	W	1608, 1884, 1891, 2123, 2625
	IP	1884, 1891, 2123, 2625
	SF	1884, 1891, 2123, 2625
Sc IV	EL	2826
	CL	2826
	W	2826
	IP	2826
	PT	2826
	AT	1837
Sc V	EL	2826
	W	2826
Sc VI	EL	1941
	CL	1941
	W	1941
Sc VII	EL	1941
	CL	1941
	W	1941
Sc VIII	EL	1941
	CL	1941
	W	1941
Sc X	EL	1558
	CL	1558
	W	1558
	IP	1558
Sc XII	OT	1745
Sc XIII	EL	1333, 2039A, 2181
	ND	2180
	CL	1333, 2039A, 2181
	W	1333, 2039A, 2181
	AT	2180
Sc XIV	EL	1333, 2183, 2321, 2563, 2877
	ND	2563
	CL	1333, 2183, 2277, 2563, 2877
	W	1333, 2183, 2277, 2563, 2877
Sc XV	EL	1333, 2321, 2563
	ND	2563
	CL	1333, 2321, 2563
	W	1333, 2563
Sc XVI	EL	1333, 1481, 2076, 2563
	ND	2563
	CL	1333, 1481, 2563
	W	1333, 1481, 2563
	OT	1481
Sc XVII	EL	2076, 2563
	CL	2563
	W	2563
Sc XVIII	EL	2563
	CL	2563
	W	2563
	OT	3136
Sc XIX	EL	1816
	CL	1816
	W	1816
	IP	1816
	OT	1816
Ti I	EL	1727A
	CL	1727A, 2645
	W	1727A
	ZE	1628
	Hfs	2101, 2708
	IP	2374
	PT	2375
	AT	1586
	OT	1586, 1831, 2375
Ti II	EL	1727A
	CL	1727A, 2645

Ti II—Continued		
	W	1727A
	AT	1571, 1821, 1973
	OT	1571, 3028
Ti III	CL	2645
	PT	1373, 1655
	AT	1576, 1624
Ti IV	EL	2753
	CL	2753
	W	2753
	IP	2753
	SF	2753
Ti V	PT	1837
	AT	1837
Ti VI	EL	1559, 1941
	CL	1559, 1941
	W	1559
Ti VII	EL	1559, 1941
	CL	1559, 1941
	W	1559
Ti VIII	EL	1941
	CL	1941
Ti IX	EL	1941
	CL	1941
Ti XI	EL	1558
	CL	1558, 1941
	W	1558
	IP	1558
Ti XII	OT	1731
Ti XIII	TE	2843
	OT	1745, 2843
Ti XIV	EL	1333, 2039A, 2181, 2549
	CL	1333, 2039A, 2181
	W	1333, 2039A, 2181, 2549
Ti XV	EL	1333, 2183, 2321, 2412, 2549, 2563, 2877
	ND	2563
	CL	1333, 2183, 2277, 2412, 2563, 2877
	W	1333, 2183, 2277, 2412, 2549, 2563, 2877
Ti XVI	EL	1333, 2412, 2549, 2563, 2937
	ND	2563
	CL	1333, 2412, 2549, 2563, 2937
	W	1333, 2412, 2549, 2563, 2937
	OT	2549
Ti XVII	EL	1481, 2076, 2277, 2412, 2563, 2877, 2937
	ND	2563
	CL	1481, 2277, 2412, 2563, 2877, 2937
	W	1481, 2277, 2412, 2563, 2877, 2937
	OT	1481, 2937
Ti XVIII	EL	2076, 2412, 2563, 2935
	ND	2563
	CL	2412, 2563, 2935
	W	2412, 2563, 2935
Ti XIX	EL	2412, 2487A, 2563, 3136
	ND	2563
	CL	2412, 2487A, 2563, 3136
	W	2412, 2487A, 2563, 3136
	OT	3136
Ti XX	EL	1816, 2560, 2561, 3122
	CL	1816, 2560, 2561, 3122
	W	1816, 2560, 2561, 3122
	IP	1816, 2561
	OT	1816
Ti XXI	EL	2479, 2560, 2618, 2991, 3027, 3122
	CL	2479, 2560, 2991, 3027, 3122
	W	1428, 2479, 2560, 2991, 3027, 3122
	IP	3122
	OT	2479, 2991
Ti XXII	EL	2991, 3027
	CL	2991, 3027
	W	2991, 3027
	OT	2991
V I	ND	2032
	Hfs	2032, 2075A, 2101, 2708
	AT	2964, 3124
V II	EL	2047A
	CL	2047A, 2645
	W	2047A
	PT	2375
	AT	1586
	OT	1586, 2049A, 2375
V III	CL	2645
	PT	1373, 1655
	AT	1983
	OT	1983
V IV	PT	1373
	AT	1576, 1624, 2320
	OT	2320
V V	EL	2123, 2284, 2447
	CL	2123, 2284, 2447
	W	2123, 2284, 2447
	IP	2123, 2284, 2447
	SF	2123, 2447
V VI	EL	1837
	CL	1837
	W	1837
	PT	1837
	AT	1837
V VII	EL	1941
	CL	1941
	W	1941

V VIII	EL	1941
	CL	1941
	W	1941
V IX	EL	1468, 1941
	CL	1468, 1941
	W	1468, 1941
V X	EL	1468, 1941
	CL	1468, 1941
	W	1468, 1941
V XI	EL	1669
	CL	1669
	W	1669
V XII	EL	1669, 1941
	CL	1669, 1941
	W	1669, 1941
	IP	1558
V XIII	EL	1669, 1941
	CL	1669, 1941
	W	1669, 1941
	IP	1941
	OT	1731, 2129
V XIV	OT	1745
V XV	EL	1333, 2039A, 2181, 2549
	CL	1333, 2039A, 2181
	W	1333, 2039A, 2181, 2549
	AT	2039A
V XVI	EL	1333, 2183, 2341, 2549, 2563, 2877
	ND	2563
	CL	1333, 2183, 2277, 2341, 2563, 2877
	W	1333, 2183, 2277, 2341, 2549, 2563, 2877
V XVII	EL	1333, 2277, 2341, 2549, 2563, 2877, 2937
	ND	2563
	CL	1333, 2277, 2341, 2549, 2563, 2877, 2937
	W	1333, 2277, 2341, 2549, 2563, 2877, 2937
	OT	2549
V XVIII	EL	1481, 2076, 2277, 2341, 2563, 2877, 2937
	ND	2563
	CL	1481, 2277, 2341, 2563, 2877, 2937
	W	1481, 2277, 2341, 2563, 2877, 2937
	OT	1481, 2937
V XIX	EL	2076, 2277, 2341, 2563, 2877, 2935
	ND	2563
	CL	2277, 2341, 2563, 2877
	W	2277, 2341, 2563, 2877, 2935
V XX	EL	2277, 2341, 2563, 2877
	ND	2563
	CL	2277, 2341, 2563, 2877
	W	2277, 2341, 2563, 2877
V XX—Continued		
	AT	2076
	OT	3136
V XXI	EL	1816, 2560, 2561, 3122
	CL	1816, 2560, 2561, 3122
	W	1816, 2341, 2560, 2561, 3122
	IP	1816, 2561
	OT	1816
V XXII	EL	2560, 3122
	CL	2560, 3122
	W	2560, 3122
	IP	3122
Cr$^-$	EL	2296
Cr I	EL	2832
	CL	2832
	W	2832
	Hfs	2708
	IP	2832
	AT	1768
	OT	1831
Cr II	AT	1821, 1973
	OT	1467
Cr III	CL	2645
	PT	1373, 1655
	AT	1586
	OT	1586
Cr IV	EL	1932
	ND	1932
	CL	1932
	W	1932
	AT	1571
	OT	1571
Cr V	EL	1933
	CL	1933
	W	1933
	IP	1933
	AT	1576, 1624, 2320
	OT	2320
Cr VI	EL	2229
	CL	2229
	W	2229
	IP	2229
Cr VII	EL	1837
	CL	1837
	W	1837
	PT	1837
	AT	1837
Cr VIII	EL	1941
	CL	1941
	W	1941
Cr IX	EL	1468, 1941
	CL	1468, 1941
	W	1468, 1941

Cr X	EL	1468, 1941
	CL	1468, 1941
	W	1468, 1941
Cr XI	EL	1468, 1941
	CL	1468, 1941
	W	1468, 1941
Cr XII	EL	1468, 1669
	CL	1468, 1669
	W	1468, 1669
Cr XIII	EL	1669, 1941
	CL	1669, 1941
	W	1669, 1941
	IP	1558
Cr XIV	EL	1669, 1941
	CL	1458, 1669, 1941
	W	1458, 1669, 1941
	IP	1941
	OT	1731
Cr XV	EL	1476
	CL	1476
	W	1476
	TE	2843
	OT	1476, 1745, 2843
Cr XVI	EL	1333, 1476, 2039A, 2181, 2549
	CL	1333, 1476, 2039A, 2181
	W	1333, 1476, 2039A, 2181, 2549
	OT	1476
Cr XVII	EL	1333, 1476, 2183, 2549, 2563
	CL	1333, 1476, 2183, 2549, 2563
	W	1333, 1476, 2183, 2549, 2563
	OT	1476, 2549
Cr XVIII	EL	1333, 1476, 2549, 2563, 2937
	CL	1333, 1476, 2549, 2563, 2937
	W	1333, 1476, 2549, 2563, 2937
	OT	1476, 2549
Cr XIX	EL	1476, 2076, 2563, 2937
	CL	1476, 2563, 2937
	W	1476, 2563, 2937
	OT	1476, 2937
Cr XX	EL	2563, 2935
	CL	2563, 2935
	W	2563, 2935
	TE	2076
	AT	2076
Cr XXI	EL	2481, 2563
	CL	2481, 2563
	W	2481, 2563
	AT	2076
	OT	3136
Cr XXII	EL	1816, 2561
	CL	1816, 2561
	W	1816, 2561
Cr XXII—Continued		
	IP	1816, 2561
	OT	1816
Cr XXIII	EL	1476, 2479
	CL	1476, 2479
	W	1428, 1476, 2479
	OT	1476, 2479
Cr XXIV	EL	1476
	CL	1476
	W	1476
	OT	1476
Mn I	Hfs	1651, 1969, 2708
	PT	1969
	AT	1969
Mn II	OT	2049A
Mn III	ND	2402
	PT	1655, 2402
Mn IV	AT	1571, 1586, 2732, 3014
	OT	1571, 1586
Mn VI	EL	2583A
	CL	2583A
	W	2583A
	AT	2320
	OT	2320
Mn VIII	EL	1837
	CL	1837
	W	1837
	PT	1837
	AT	1837
Mn IX	EL	1669
	CL	1669
	W	1669
Mn X	EL	1468, 1669
	CL	1468, 1669
	W	1468, 1669
Mn XI	EL	1468, 1669
	CL	1468, 1669
	W	1468, 1669
Mn XII	EL	1468, 1669, 1941
	CL	1468, 1669, 1941
	W	1468, 1669, 1941
Mn XIII	EL	1468, 1669
	CL	1468, 1669
	W	1468, 1669
Mn XIV	EL	1468, 1669, 1941
	CL	1468, 1669, 1941
	W	1468, 1669, 1941
	IP	1558
Mn XV	EL	1669, 1941
	CL	1458, 1669, 1941

Mn xv—Continued		
	W	1458, 1669, 1941
	IP	1941
	OT	1731
Mn xvi	EL	1476
	CL	1476
	W	1476
	OT	1476, 2108
Mn xvii	EL	1333, 1476, 2039A, 2181, 2549
	CL	1333, 1476, 2039A, 2181
	W	1333, 1476, 2039A, 2181, 2549
	OT	1476
Mn xviii	EL	1333, 1476, 2183, 2277, 2549, 2563, 2877
	CL	1333, 1476, 2183, 2277, 2549, 2563, 2877
	W	1333, 1476, 2183, 2277, 2549, 2563, 2877
	OT	1333, 1476, 2549
Mn xix	EL	1333, 1476, 2277, 2549, 2563, 2877, 2937
	CL	1333, 1476, 2277, 2549, 2563, 2877, 2937
	W	1333, 1476, 2277, 2549, 2563, 2877, 2937
	OT	1333, 1476, 2549
Mn xx	EL	1476, 2076, 2563, 2937
	CL	1476, 2076, 2563, 2937
	W	1476, 2563, 2937
	AT	2076
	OT	1476, 2937
Mn xxi	EL	2563, 2935
	CL	2563, 2935
	W	2563, 2935
	TE	2076
	AT	2076
Mn xxii	EL	2563
	CL	2563
	W	2563
	AT	2076
	OT	3136
Mn xxiii	EL	1816
	CL	1816
	W	1816
	IP	1816
	OT	1816
Mn xxiv	EL	2479
	CL	2479
	W	1428, 2479
	OT	2479
Fe^{--}	AT	1656
Fe^{-}	AT	1656
Fe i	EL	2637
	ND	2518
	CL	2637
Fe i—Continued		
	W	1681, 2637
	Hfs	2708
	PT	1936, 2375, 2518
	AT	1308, 1443, 1656, 1768, 2119, 2459A
	OT	1312, 2375, 2878
Fe ii	EL	2479, 2719
	ND	2719
	CL	2479, 2645, 2719
	W	1459, 1681, 2479, 2637, 2719
	AT	1571, 1656, 1768, 1821, 1973
	OT	1571, 2479, 2878
Fe iii	W	1459, 1681
	PT	1655
	AT	1571, 1656
	OT	1571, 2049A, 2878
Fe iv	W	1767
	AT	1656, 2699
	OT	2878, 3029
Fe v	EL	2884
	CL	2884
	W	1370A, 1767, 2884
	PT	2884
	AT	1656, 3014
	OT	2878, 2884
Fe vi	EL	2278, 2327
	ND	2278, 2327
	CL	2278, 2327, 2884
	W	1370A, 1767, 2278, 2327, 2884
	PT	2327
	AT	1656, 2278, 2327
	OT	1467, 2878
Fe vii	EL	2278
	ND	2278
	CL	2278
	W	1370A, 1767, 2278
	AT	2278
Fe viii	W	1370A, 1767
	OT	1312
Fe ix	EL	1837, 2546, 2754
	CL	1837, 2546, 2754, 3151
	W	1669, 1837, 2546
	PT	1837
	AT	1837
Fe x	EL	1468, 1669, 2546
	CL	1458, 1468, 1669, 2546
	W	1458, 1468, 1669, 1905A, 2546
	AT	1458, 1669
	OT	3104
Fe xi	EL	1468, 1669, 2546, 2728
	CL	1458, 1468, 1669, 2546, 2728
	W	1457, 1458, 1459, 1468, 1669, 2546, 2728
	AT	1458, 1669
	OT	3104

Fe XII	EL	1468, 1669
	CL	1458, 1468, 1609, 1669
	W	1457, 1458, 1459, 1468, 1609, 1669
	PT	2609
	AT	1458, 1669
Fe XIII	EL	1468, 1669
	ND	2690
	CL	1458, 1468, 1669, 2557
	W	1428, 1458, 1459, 1468, 1669
	PT	2690
	AT	1458, 1669, 2063
	OT	2107, 2557, 2635
Fe XIV	EL	1468, 1669, 1976, 3074
	CL	1458, 1468, 1669, 1976, 3074
	W	1457, 1458, 1468, 1669, 1976, 3074
	AT	1458, 1669
	OT	3104
Fe XV	EL	1468, 1476, 1669, 1808, 1976, 1999
	CL	1468, 1476, 1669, 1808, 1941, 1976, 1999
	W	1468, 1476, 1669, 1808, 1976, 1999
	IP	1558
	AT	1999
	OT	1467, 1476, 1808
Fe XVI	EL	1669, 1976
	CL	1458, 1669, 1976
	W	1458, 1669, 1976, 2034
	IP	1399
	AT	1399, 1622
Fe XVII	EL	1476, 2034, 2537, 2866A
	CL	1476, 2034, 2114, 2187, 2537, 2866A
	W	1428, 1476, 2034, 2114, 2187, 2537, 2786, 2866A, 3224
	TE	2843
	PT	1381
	AT	2866A
	OT	1476, 2108, 2843
Fe XVIII	EL	1333, 1476, 1663, 2039A, 2181, 2537, 2549, 2636, 2721, 2866A, 2936
	ND	2180
	CL	1333, 1476, 1663, 2039A, 2076, 2181, 2537, 2636, 2721, 2866A, 2936
	W	1333, 1476, 1663, 2039A, 2181, 2537, 2549, 2636, 2721, 2866A, 2936
	PT	2040A
	AT	2039A, 2180, 2181, 2478, 2866A
	OT	1333, 1476, 2721, 2936
Fe XIX	EL	1333, 1476, 2321, 2519A, 2534A, 2537, 2549, 2563, 2636, 2721, 2866A, 2877, 2936
	CL	1333, 1476, 2076, 2277, 2321, 2519A, 2534A, 2537, 2549, 2563, 2636, 2721, 2866A, 2877, 2936
	W	1333, 1476, 2277, 2519A, 2534A, 2537, 2549, 2563, 2636, 2721, 2866A, 2877, 2936
	PT	2040A
Fe XIX—Continued	AT	2321, 2478, 2866A
	OT	1333, 1476, 2321, 2534A, 2549, 2721, 2936
Fe XX	EL	1333, 1476, 2277, 2321, 2519A, 2537, 2549, 2563, 2636, 2877, 2937
	CL	1333, 1476, 2076, 2277, 2321, 2519A, 2537, 2549, 2563, 2636, 2877, 2937
	W	1333, 1428, 1462, 1476, 2277, 2519A, 2537, 2549, 2563, 2636, 2877, 2937
	AT	2321
	OT	1333, 1476, 2321, 2479, 2549
Fe XXI	EL	1476, 2076, 2321, 2519A, 2534A, 2537, 2563, 2636, 2936, 2937
	CL	1476, 2076, 2321, 2519A, 2534A, 2537, 2563, 2636, 2936, 2937
	W	1462, 1476, 2479, 2519A, 2534A, 2537, 2563, 2636, 2936, 2937
	AT	2076, 2321, 2478
	OT	1476, 2321, 2479, 2534A, 2936, 2937
Fe XXII	EL	2321, 2479, 2519A, 2537, 2563, 2636, 2935
	CL	2076, 2321, 2479, 2519A, 2537, 2563, 2636, 2935
	W	1428, 1462, 2479, 2519A, 2537, 2563, 2636, 2935
	TE	2076
	AT	1327, 2076, 2321, 2478
	OT	2321, 2479, 2936, 2937, 3136
Fe XXIII	EL	1797, 2304, 2321, 2479, 2534A, 2537, 2481, 2563, 2602, 2636
	CL	1797, 2076, 2304, 2321, 2479, 2534A, 2481, 2537, 2563, 2602, 2636
	W	1462, 1797, 2304, 2479, 2481, 2534A, 2537, 2563, 2602, 2636
	AT	1797, 2076, 2321, 2478
	OT	1808, 2321, 2479, 2534A, 2936, 3136
Fe XXIV	EL	1797, 1808, 2304, 2321, 2479, 2602, 2636, 2728, 3224
	CL	1797, 1808, 2304, 2321, 2479, 2602, 2636, 2728, 3224
	W	1428, 1462, 1797, 1808, 2304, 2479, 2602, 2636, 2728, 3153, 3224
	TE	2934
	PT	2040A
	AT	1797, 2321, 2478
	OT	1808, 1844, 1977, 2321, 2479, 2561, 2934
Fe XXV	EL	1428, 2479, 2602, 2636, 2991, 3027
	CL	1428, 2285, 2479, 2602, 2636, 2664, 2665, 2991, 3027
	W	1428, 1462, 2479, 2602, 2636, 2664, 2665, 2991, 3027, 3153, 3224
	TE	2285
	PT	2040A
	AT	2989
	OT	1428, 1844, 1977, 2285, 2479, 2748, 2991

Fe XXVI	EL	2479, 2991, 3027
	CL	2479, 2991, 3027
	W	1428, 2479, 2991, 3027
	OT	2479, 2991
Co I	Hfs	1738A, 2708
	AT	1768, 2964
Co II	EL	2115
	CL	2645
	ZE	2115
	IP	2115
	OT	2049A
Co III	PT	1655
Co IV	EL	2763
	CL	2763
	W	2763
Co X	EL	1941
	CL	1941
	W	1639, 1941
	AT	1837
Co XI	EL	1639, 1941
	CL	1639, 1941
	W	1639, 1941
Co XII	EL	1639, 1941
	CL	1639, 1941
	W	1639, 1941
Co XIII	EL	1639, 1941
	CL	1639, 1941
	W	1639, 1941
Co XIV	EL	1639, 1941
	CL	1639, 1941
	W	1639, 1941
Co XV	EL	1639, 1941
	CL	1639, 1941
	W	1639, 1941
Co XVI	EL	1476, 1639, 1941
	CL	1476, 1639, 1941
	W	1476, 1639, 1941
	OT	1476
Co XVII	EL	1639, 1941
	CL	1458, 1639, 1941
	W	1458, 1639, 1941
	IP	1399
	AT	1399, 1622
Co XVIII	EL	1476
	CL	1476
	W	1476
	OT	1476, 2108
Co XIX	EL	1476, 2039A, 2181, 2549
	CL	1476, 2039A, 2181, 2549
	W	1476, 2039A, 2181, 2549
	OT	1476, 2549
Co XX	EL	1476, 2519A, 2549
	CL	1476, 2519A, 2549
	W	1476, 2519A, 2549
	PT	1430
	OT	1476, 2549
Co XXI	EL	1476, 2519A, 2549
	CL	1476, 2519A, 2549
	W	1476, 2519A, 2549
	OT	1476, 2549
Co XXII	EL	1476, 2519A, 2937
	CL	1476, 2519A, 2937
	W	1476, 2519A, 2937
	TE	2076
	OT	1476, 2937
Co XXIII	EL	2519A, 2935
	CL	2519A, 2935
	W	2519A, 2935
	TE	2076
Ni I	CL	2645
	ZE	1712
	Hfs	1712, 2516A, 2708
	AT	1768
	OT	1831
Ni II	EL	1398
	ND	1398
	CL	1398, 2645
	W	1398, 1459
	PT	1631
	OT	2049A, 2895
Ni III	EL	2048A, 2453A
	CL	2048A
	W	2048A
	PT	1373, 1655, 2048A
	OT	2049A
Ni IV	W	1767
Ni V	EL	2763
	CL	2763
	W	1767, 2763
Ni VI	W	1767
Ni VII	W	1767
Ni VIII	W	1767
Ni XI	EL	1837, 1941
	CL	1837, 1941, 2754, 3151
	W	1457, 1639, 1941
	TE	2754
	PT	1837
	AT	1837
	OT	2754
Ni XII	EL	1639, 1941
	CL	1639, 1941
	W	1639, 1941
Ni XIII	EL	1639, 1941
	CL	1639, 1941
	W	1459, 1639, 1941

Ni xiv	EL	1639, 1941
	CL	1639, 1941
	W	1459, 1639, 1941
	PT	2609
Ni xv	EL	1639, 1941
	CL	1639, 1941
	W	1459, 1639, 1941
Ni xvi	EL	1639, 1941
	CL	1639, 1941
	W	1639, 1941
Ni xvii	EL	1639, 1941
	CL	1458, 1639, 1941
	W	1458, 1639, 1941
	AT	1458
	OT	1476, 1941
Ni xviii	EL	1941
	CL	1458, 1941
	W	1458, 1941
	IP	1399
	AT	1399, 1458, 1622
Ni xix	EL	1476
	CL	1476
	W	1476
	OT	1476, 2108
Ni xx	EL	1476, 2549
	CL	1476, 2549
	W	1476, 2549
	OT	1476, 2549
Ni xxi	EL	1476, 2519A, 2549, 2563
	CL	1476, 2519A, 2549, 2563
	W	1476, 2519A, 2549, 2563
	PT	1430
	OT	1476, 2549
Ni xxii	EL	1476, 2519A, 2549, 2563
	CL	1476, 2519A, 2549, 2563
	W	1476, 2519A, 2549, 2563
	OT	1476, 2549
Ni xxiii	EL	1476, 2519A, 2563, 2937
	CL	1476, 2519A, 2563, 2937
	W	1476, 2519A, 2563, 2937
	TE	2076
	OT	1476, 2937
Ni xxiv	EL	2519A, 2563, 2935
	CL	2519A, 2563, 2935
	W	2519A, 2563, 2935
	TE	2076
	OT	2937
Ni xxv	EL	2563
	CL	2563
	W	2563
	TE	2481
	OT	2481

Ni xxvi	TE	2934
	OT	1844, 2934
Ni xxvii	W	1428
	OT	1844
Ni xxviii	W	1428
Cu$^-$	EL	1470, 1916, 1996A
Cu i	EL	1418, 1923
	CL	1418, 1923, 2263
	W	1418, 1923, 2471
	SE	2467, 2663
	Hfs	1904, 2708
	IP	1923
	PT	3052
	AT	1516
Cu ii	EL	1408
	ND	1408
	CL	1408
	W	1408
	Hfs	1408
	AT	1516, 1566, 1605, 1821, 1973
	OT	1664
Cu iii	EL	2987
	CL	2987
	W	2987
	IP	2987
	PT	1373
	AT	1516
Cu iv	EL	2987
	W	1493
Cu v	EL	2840
	CL	2840
	W	1493, 2840
Cu vi	EL	2763, 2840
	CL	2763, 2840
	W	1493, 2763, 2840
Cu xii	AT	1837
Cu xiii	EL	2923
	CL	2923
	W	2923
Cu xiv	EL	2923
	CL	2923
	W	2923
Cu xv	EL	2923
	CL	2923
	W	2923
Cu xvi	EL	2923
	CL	2923
	W	2923
Cu xvii	EL	2923
	CL	2923
	W	2923

Cu XVIII	EL	1476, 2923
	CL	1476, 2923
	W	1476, 2923
	OT	1476
Cu XX	EL	1476
	CL	1476
	W	1476
	OT	1476, 2108
Cu XXI	EL	1476
	ND	2180
	CL	1476
	W	1476
	AT	2180
	OT	1476
Cu XXII	EL	1476
	CL	1476
	W	1476
	PT	1430
	OT	1476
Cu XXIII	EL	1476
	CL	1476
	W	1476
	OT	1476
Cu XXIV	EL	1476
	CL	1476
	W	1476
	OT	1476
Cu XXVII	OT	1844
Cu XXVIII	EL	2479, 2991, 3027
	CL	2479, 2991, 3027
	W	1428, 2479, 2991, 3027
	OT	1844, 2479, 2991
Cu XXIX	EL	2991, 3027
	CL	2991, 3027
	W	2991, 3027
	OT	2991
Zn$^-$	EL	3112
Zn I	EL	1679, 2882, 3131
	ND	1779
	CL	1679, 1886, 3131
	W	1679, 1886, 3131
	IP	3131
	PT	1779, 1886
	AT	2898
Zn III	PT	1373
Zn V	EL	2289
	CL	2289
	W	2289
	OT	2289
Zn VI	EL	2289
	CL	2289
	W	2289
	OT	2289, 2840
Zn VII	OT	2763, 2840
Zn XIII	EL	2923
	CL	2923
	W	2923
Zn XIV	EL	2923
	CL	2923
	W	2923
Zn XV	EL	2923
	CL	2923
	W	2923
Zn XVI	EL	2923
	CL	2923
	W	2923
Zn XVII	EL	2923
	CL	2923
	W	2923
Zn XVIII	EL	2923
	CL	2923
	W	2923
Zn XIX	EL	2923
	CL	2923
	W	2923
Zn XX	EL	2923
	CL	2923
	W	2923
Zn XXI	EL	2951
	CL	2460, 2951
	W	2460, 2951
	OT	2108
Zn XXII	CL	2460
	W	2460
Zn XXIII	CL	2460
	W	2460
Ga$^-$	EL	2296
Ga I	Hfs	1466
Ga III	EL	2051A, 3141
	ND	2051A
	CL	2051A, 3141
	W	2051A, 3141
	IP	2051A
Ga IV	EL	2051A, 2716, 3042, 3141
	ND	2051A, 2716
	CL	2051A, 2716, 3042
	W	2051A, 2716, 3042, 3141
	IP	2051A
	PT	1373
Ga V	EL	1964, 2051A, 2289, 2612, 2703
	ND	2051A, 2703
	CL	1964, 2051A, 2289, 2612, 2703
	W	1964, 2051A, 2289, 2612, 2703
	IP	2051A
	OT	2289

Ga VI	EL	2051A, 2289
	ND	2051A
	CL	2051A, 2289
	W	2051A, 2289
	IP	2051A
	OT	2289
Ga VII	EL	2289
	CL	2289
	W	2289
	OT	2289, 2840
Ga VIII	OT	2840
Ga XII	EL	2923
	CL	2923
	W	2923
Ga XIII	EL	2923
	CL	2923
	W	2923
Ga XIV	EL	2923
	CL	2923
	W	2923
Ga XV	EL	2923
	CL	2923
	W	2923
Ga XVI	EL	2923
	CL	2923
	W	2923
Ga XVII	EL	2923
	CL	2923
	W	2923
Ga XVIII	EL	2923
	CL	2923
	W	2923
Ga XIX	EL	2923
	CL	2923
	W	2923
Ga XX	EL	2923
	CL	2923
	W	2923
Ga XXI	EL	2923
	CL	2923
	W	2923
Ge$^-$	EL	2296
Ge I	PT	1643
Ge III	EL	2051A
	ND	2051A
	CL	2051A
	W	2051A
	IP	2051A
Ge IV	EL	2051A
	ND	2051A
	CL	2051A
Ge IV—Continued	W	2051A
	IP	2051A
Ge V	EL	2051A, 2716, 3045
	ND	2051A, 2716
	CL	2051A, 2716, 3045
	W	2051A, 2716, 3045
	IP	2051A
Ge VI	EL	2051A, 3044
	ND	2051A
	CL	2051A, 3044
	W	2051A, 3044
	IP	2051A
Ge XIII	EL	2923
	CL	2923
	W	2923
Ge XIV	EL	2923
	CL	2923
	W	2923
Ge XV	EL	2923
	CL	2923
	W	2923
Ge XVI	EL	2923
	CL	2923
	W	2923
Ge XVII	EL	2923
	CL	2923
	W	2923
Ge XVIII	EL	2923
	CL	2923
	W	2923
Ge XIX	EL	2923
	CL	2923
	W	2923
Ge XX	EL	2923
	CL	2923
	W	2923
Ge XXI	EL	2923
	CL	2923
	W	2923
Ge XXII	EL	2923
	CL	2923
	W	2923
Ge XXIII	EL	2951
	CL	2951
	W	2951
Ge XXIV	W	2951
As$^-$	EL	2296
As I	EL	1351
	ND	1351

As I—Continued		
	CL	1351, 2559
	W	1351, 2559
	Hfs	2541, 2709
	IP	1351
	AT	2541
As II	EL	1368A, 1480
	ZE	1368A, 1480
	PT	1368A, 1777
	AT	1368A, 1777
As XIV	EL	2923
	CL	2923
	W	2923
As XV	EL	2923
	CL	2923
	W	2923
As XVI	EL	2923
	CL	2923
	W	2923
As XVII	EL	2923
	CL	2923
	W	2923
As XVIII	EL	2923
	CL	2923
	W	2923
As XXI	EL	2923
	CL	2923
	W	2923
As XXII	EL	2923
	CL	2923
	W	2923
As XXIII	EL	2923
	CL	2923
	W	2923
Se^-	EL	1420A, 2247
Se I	EL	1791, 2647
	ND	2647
	CL	1791, 2647
	W	1557, 1791, 2647, 2888A
	ZE	1643
	Hfs	1643
	IP	2647
	PT	1643, 3095
	AT	3095
	OT	2647
Se II	CL	1427
	W	1427
Se III	EL	1427
	CL	1427
	W	1427
	IP	1427
	OT	1427

Se IV	EL	1427, 2611
	CL	1427, 2611
	W	1427, 2611
	IP	1427
	OT	1427
Se V	EL	1427
	CL	1427
	W	1427
	IP	1427
Se XV	EL	2923
	CL	2923
	W	2923
Se XVI	EL	2923
	CL	2923
	W	2923
Se XVIII	EL	2923
	CL	2923
	W	2923
Se XIX	EL	2923
	CL	2923
	W	2923
Se XXII	EL	2923
	CL	2923
	W	2923
Se XXIII	EL	2923
	CL	2923
	W	2923
Se XXIV	EL	2923
	CL	2923
	W	2923, 2951
Se XXV	EL	2951
	CL	2951
	W	2951
Br^-	EL	2880
	CL	2880
	W	2880
	OT	1802
Br I	EL	2069, 2379, 2880
	CL	1505, 2069, 2880
	W	1505, 2069, 2880
	Hfs	2681
	PT	2933
	AT	2681
	OT	2647
Br XVI	EL	2923
	CL	2923
	W	2923
Br XIX	EL	2923
	CL	2923
	W	2923

Br XXIV	EL	2923
	CL	2923
	W	2923
Br XXV	EL	2923
	CL	2923
	W	2923
	OT	2129
Br XXVI	EL	2951
	CL	2951
	W	2951
Kr	EL	1545, 2200, 2219, 2700
	CL	1545, 2200, 2219
	W	1545, 2200, 2219
Kr I	EL	1437, 1526, 1788, 1819, 2325A, 2385, 2427, 2429, 2524A, 2963
	CL	1437, 1526, 1788, 1819, 2325A, 2385, 2427, 2429, 2524A
	W	1437, 1526, 1788, 1819, 2325A, 2385, 2427, 2429, 2524A, 3032
	SE	2220, 2619, 2905
	IP	2431
	PT	1985, 2619
	AT	1991, 2553, 2823
	OT	2208, 2313, 2427, 2647, 2823, 2905
Kr II	EL	1526
	ND	2919
	PT	2919
	OT	2208
Kr III	ND	2287, 2919
	PT	2287, 2919
	AT	2287
	OT	2208
Kr IV	EL	3055
	ND	2491A
	CL	3055
	W	3055
	OT	2208
Kr V	EL	3055
	CL	3055
	W	3055
	OT	2208
Kr VI	OT	2208
Kr VII	EL	3055
	CL	3055
	W	3055
	OT	2208
Kr VIII	OT	2208
Kr IX	W	2885A
	OT	2208
Kr X	W	2885A
	OT	2208
Kr XI	OT	2208
Kr XII	OT	2208
Kr XIII	OT	2208
Kr XIV	OT	2208
Kr XV	OT	2208
Kr XVI	OT	2208
Kr XVII	OT	2208
Kr XVIII	OT	2208
Kr XIX	OT	2208
Kr XX	OT	2208
Kr XXI	OT	2208
Kr XXII	OT	2208
Kr XXIII	OT	2208
Kr XXIV	OT	2208
Kr XXV	OT	2208
Kr XXVI	OT	2208
Kr XXVII	OT	2208
Kr XXVIII	OT	2208
Kr XXIX	OT	2208
Kr XXX	OT	2208
Kr XXXI	OT	2208
Kr XXXII	OT	2208
Kr XXXIII	OT	2208
Kr XXXIV	OT	2208
Kr XXXV	QF	2907A
	OT	2208
Kr XXXVI	OT	2208
Rb$^-$	EL	2158A, 2296, 2551, 2671
	OT	2157A, 2633
Rb I	EL	2152A, 2660, 2751, 3058, 3219
	CL	2660, 3058, 3219
	W	2660, 3058, 3219
	ZE	1364A, 1747A, 1914A, 1950, 2113, 2160A, 2161A, 2291, 2390, 2394, 2532A, 2540, 2565A, 2755, 3046
	SE	1497A, 1590, 1707A, 1877, 2253, 2506A, 3001
	Hfs	1416, 1512, 1527A, 1529A, 1530A, 1531A, 1620, 1763, 1815, 1857A, 1908A, 1950, 1979, 1981, 2001, 2113, 2118, 2203, 2390, 2505A, 2506A, 2526A, 2540, 2751, 2755, 2851, 2927, 2954, 2956, 2984, 3000, 3137
	IS	1529A, 1698A, 1759
	IP	2660
	AT	2731, 3058
	OT	1456, 1742, 2647
Rb II	EL	1483, 2590, 2698
	ND	2590, 2698
	CL	1483, 2590, 2698
	W	1483, 2590, 2698
	ZE	2161A, 2590, 2698
	Hfs	2291
	IP	1483, 2590, 2698
	PT	2044A, 2590, 2698
	AT	1665, 2044A, 2553, 2590, 2698
Rb III	EL	1677A, 1776, 1896, 2485A
	ND	1776, 1896, 2492A, 2933
	CL	1677A, 1776, 2485A
	W	1677A, 1776, 2485A
	ZE	1776

Rb III—Continued	IP	1776
	PT	1677A, 1776
	AT	1776, 2740
Rb IV	EL	2287, 2485A
	ND	2287
	CL	2287, 2485A
	W	2287, 2485A
	PT	2287
	AT	2287, 2740
Sr I	EL	2631, 2800, 2812A
	CL	2631, 2800, 2812A
	W	1492, 2631, 2800, 2812A
	ZE	2066A, 2307
	SE	1465, 2020, 2307
	Hfs	2066A, 2515
	IP	2874
	PT	2808
	AT	1626, 2800
Sr II	CL	2631
	W	2631
	AT	2800
Sr III	EL	1483, 1771, 2486A, 2596
	ND	2596
	CL	1483, 1771, 2486A
	W	1483, 1771, 2486A
	IP	1483, 1771
	PT	1771, 2044A, 2596
	AT	1665, 2044A, 2596
Sr IV	EL	1676A, 2485A, 2486A
	CL	1676A, 2485A, 2486A
	W	1676A, 2485A, 2486A
	IP	2492A, 2955
	PT	1676A
	AT	1676A
	OT	2955
Sr V	EL	2287, 2485A, 2486A
	ND	2287
	CL	2287, 2485A, 2486A
	W	2287, 2485A, 2486A
	PT	2287
	AT	2287
Y I	EL	2111
	CL	2111
	W	2111
	ZE	1478
	Hfs	1478
	IP	2111, 2374
	AT	2423
Y III	EL	2592
	CL	2592
	W	2592
	IP	2592
Y IV	EL	1483, 1599, 1743A
	CL	1483, 1599, 1743A
Y IV—Continued	W	1483, 1599, 1743A
	IP	1483, 1599
	PT	1743A
	AT	1599, 1665, 1743A
Y V	EL	1577, 2492A, 2955
	CL	1577, 2492A, 2955
	W	1577, 2492A, 2955
	IP	1577, 2492A, 2955
	PT	1577, 2492A, 2933
	AT	1577
	OT	2955
Y VI	EL	1921
	CL	1921
	W	1921
	IP	1921
Y VII	EL	2491A
	IP	2491A
Y XII	PT	1773
	OT	1773
Y XXX	EL	2562
	CL	2562
	W	2562
Zr I	ND	3047
	IS	3071
	IP	2374
	PT	3047
Zr IV	IP	2592
Zr V	EL	1483
	CL	1483
	W	1483
	IP	1479, 1483
Zr VI	EL	1756, 2492A, 2933
	ND	1756
	CL	1483, 1756, 2492A, 2933
	W	1756, 2492A, 2933
	IP	1756, 2492A, 2933
	PT	1756, 2492A, 2933
	AT	1756
Zr VII	ND	1921
	IP	2491A
Zr XIII	PT	1773
	OT	1773
Zr XXIX	W	2951
Zr XXX	W	2951
Zr XXXI	EL	2562, 2951
	CL	2562, 2951
	W	2562, 2951
Nb II	PT	2375
	OT	2375
Nb VI	EL	1483
	CL	1483

Nb VI—Continued	W	1483
	IP	1479, 1483
Nb VII	EL	1757, 2492A, 2933
	ND	1757
	CL	1757, 2492A, 2933
	W	1757, 2492A, 2933
	IP	1757, 2492A, 2933
	PT	1757, 2492A, 2933
	AT	1757
Nb IX	EL	1318
	ND	2491A
	CL	1318
	W	1318
Nb XIV	PT	1773
	OT	1773
Nb XXXII	EL	2562
	CL	2562
	W	2562
Mo I	W	2471
	ZE	1640
	Hfs	1640, 2067A, 2068A, 2386, 2687, 3171
	IS	3071
Mo VII	EL	1483
	CL	1483
	W	1483
	IP	1479, 1483
Mo VIII	EL	1758, 2492A
	ND	1758
	CL	1758, 2492A
	W	1758, 2492A
	IP	1758, 2492A
	PT	1758, 2492A, 2933
	AT	1758
Mo XV	PT	1773
	OT	1773
Mo XXXIII	EL	2562
	CL	2562
	W	2562
Mo XLI	EL	2991, 3027
	CL	2991, 3027
	W	2991, 3027
	OT	2991
Mo XLII	EL	2991, 3027
	CL	2991, 3027
	W	2991, 3027
	OT	2991
Tc I	Hfs	2068A, 2071A
Ru I	ZE	2067A, 2787
	Hfs	2067A, 2787
	IS	3071

Ru I—Continued	PT	2375
	OT	2375
Ru III	EL	2050A
	CL	2050A
	W	2050A
Ru VIII	EL	1798, 2083
	ND	2083
	CL	1798, 2083
	W	1798, 2083
	IP	1798
	AT	2083
	OT	1798
Ru IX	EL	1798
	CL	1798
	W	1798
	IP	1798
Ru X	EL	1798
	CL	1798
	W	1798
	PT	2933
Rh IX	EL	1798, 2083
	ND	2083
	CL	1798, 2083
	W	1798, 2083
	IP	1798
	AT	2083
	OT	1798
Rh X	EL	1798
	CL	1798
	W	1798
	IP	1798
Rh XI	EL	1798
	CL	1798
	W	1798
	PT	2933
Pd I	Hfs	1603, 2078A, 2655, 2811
	IS	2085A, 3071
Pd X	EL	1798, 2083
	ND	2083
	CL	1798, 2083
	W	1798, 2083
	IP	1798
	AT	2083
	OT	1798
Pd XI	EL	1798
	CL	1798
	W	1798
	IP	1798
Pd XII	EL	1798
	CL	1798
	W	1798
	PT	2933

2.2 Reference Numbers for Individual Spectra—Continued

Ag$^-$	EL	1916, 1996A
Ag I	EL	1418, 2489
	ND	2489
	CL	1418, 2489
	W	1418, 2489
	SE	1349, 2663
	Hfs	1349, 1421A, 1696A, 1907A
	IS	1696A
	PT	2488A
Ag II	EL	3064
	ND	3047, 3064
	CL	3064
	W	3064
	PT	3047, 3064
Ag III	EL	3039
	CL	3039
	W	3039
	PT	3039
Ag XI	EL	1798
	CL	1798
	W	1798
	IP	1798
	OT	1798
Ag XII	EL	1798
	CL	1798
	W	1798
	IP	1798
Cd$^-$	EL	3112, 3152
Cd I	EL	1881, 1920, 2632
	ND	1779
	CL	1881, 1886, 1920, 2632
	W	1881, 1886, 1920, 2632
	ZE	1514, 2501A, 2794
	Hfs	2335A, 2568A, 2614, 2794
	IS	2894A, 3071
	PT	1685A, 1779, 1886
	AT	1486, 1881, 3076
	OT	3076
Cd II	EL	2839
	ZE	2601
	Hfs	2112, 2601
	IS	1410, 1417, 1812
	AT	2005, 2839
Cd III	EL	2839
	AT	2839
In$^-$	EL	2296
In I	Hfs	1466, 2709
In III	CL	1949
	W	1949
In IV	EL	1869
	CL	1869, 1949
	W	1869, 1949
	IP	1869
	PT	1869

Sn$^-$	EL	1470, 2296
Sn I	EL	3149A
	CL	3146, 3149A
	W	3146, 3149A
	ZE	1352
	Hfs	1352, 1600, 1692A, 2022
	IS	2021, 2022, 2623, 3071
	PT	1643, 1692A
	AT	1692A
Sn II	EL	3149A
	CL	3149A
	W	3149A
	Hfs	2022
	IS	1697A, 2022
Sn IV	IS	1410, 1417
Sn VI	EL	1798
	CL	1798
	W	1798
Sn XXI	EL	2468
	CL	2468
	W	2468
	AT	2468
Sn XXII	EL	2468
	CL	2468
	W	2468
	AT	2468
Sn XXIII	EL	2468
	ND	2468
	CL	2468
	W	2468
	AT	2468
Sn XXIV	EL	2468
	ND	2468
	CL	2468
	W	2468
	AT	2468
Sn XLV	AT	1728
	OT	1728
Sb$^-$	EL	2296
Sb I	ZE	2280
	Hfs	1692A, 2497A, 2973
	PT	1692A
	AT	1692A
Sb II	AT	1777
Sb VII	EL	1798
	CL	1798
	W	1798
Te$^-$	EL	2296
Te I	EL	2104
	CL	2104
	W	1557, 2104
	ZE	1409
	Hfs	1770
	IS	3071

Te I—Continued		
	PT	1643, 3095
	AT	3095
Te II	EL	2581
	CL	2581
	W	2581
Te VIII	EL	1798
	CL	1798
	W	1798
I^-	EL	2137, 2659, 3081
	CL	2137, 2659, 3081
	W	2137, 2659, 3081
	AT	1720
	OT	1802
I I	EL	2379
	CL	1504, 1505
	W	1504, 1505
	ZE	1699
	Hfs	1919, 2255, 2681
	AT	2681
I V	EL	1798
	CL	1798
	W	1798
I VI	EL	1798
	CL	1798
	W	1798
	IP	1798
I VII	EL	1798
	CL	1798
	W	1798
	IP	1798
I VIII	EL	1798
	CL	1798
	W	1798
I IX	EL	1798
	CL	1798
	W	1798
Xe^-	EL	1545, 2219
	CL	1545, 2219
	W	1545, 2219
Xe I	EL	1437, 1526, 1788, 2429, 2691, 2924, 3115
	CL	1437, 1526, 1788, 1975, 2046A, 2145, 2228, 2429, 2924, 2958, 3063
	W	1437, 1526, 1788, 1926, 1975, 2046A, 2429, 2924, 2941, 3002, 3063, 3115
	ZE	1360, 1487, 2121
	SE	1793, 2220, 2621, 2906, 3176
	Hfs	1350, 1487, 1568, 1648, 1684A, 2662, 2779, 2848, 2959, 3041
	IS	1444, 1472A, 1895, 2087A, 2779, 2849, 2959, 3041, 3071, 3077, 3078
	PT	1985

Xe I—Continued		
	AT	1566, 1991, 2823
	OT	1348, 1536, 2823, 2906
Xe II	EL	1526
	CL	2046A, 2145, 2958
	W	1404, 1926, 2046A, 3002
Xe III	CL	2046A
	W	1926, 2046A, 2765, 3002
Xe IV	CL	2046A
	W	1926, 2046A, 2765, 3002
Xe V	EL	2856A
Xe VI	EL	2856A
Xe VII	EL	2856A
Xe VIII	EL	2856A
Xe IX	EL	2856A
	W	2885A
Xe X	EL	2856A
Xe XI	EL	2856A
Xe XII	EL	2856A
Xe XIII	EL	2856A
Xe XIV	EL	2856A
Xe XV	EL	2856A
Xe XVI	EL	2856A
Xe XVII	EL	2856A
Xe XVIII	EL	2856A
Xe XIX	EL	2856A
Xe XX	EL	2856A
Xe XXI	EL	2856A
Xe	W	1412
Cs^-	EL	2158A, 2296, 2551, 2671
	OT	2157A, 2573A, 2633
Cs I	EL	2198, 2324A, 2574A, 2783, 2931, 2938, 3030
	CL	2198, 2324A, 2574A, 2783, 2931, 2938
	W	1314, 2198, 2324A, 2574A, 2783, 2931, 2938
	ZE	1364A, 1613, 1659, 1774, 1840, 2059A, 2390, 2394, 2742, 2755, 2977, 3046
	SE	1556, 1590, 1707A, 1877, 2165A, 2506A, 2627, 3001
	Hfs	1416, 1613, 1684A, 1763, 1774, 1840, 1857A, 1863A, 1908A, 1942, 1943, 2001, 2118, 2197, 2203, 2390, 2505A, 2506A, 2574A, 2595, 2627, 2742, 2744, 2755, 2927, 2929, 2954, 2956, 2966, 2977, 3000, 3075, 3137, 3179
	IP	2931
	PT	1943, 2931
	AT	2124, 2731, 2931
	OT	1417, 1456, 1742, 2994, 3148
Cs II	EL	2925
	ND	2925
	CL	2925
	W	2925
	IP	2925

Ba I	EL	1739A, 2098A, 2218, 2473, 2766, 2775, 2844, 2926, 3132, 3133, 3134
	ND	2844, 3017
	CL	1739A, 2098A, 2218, 2473, 2766, 2775, 2844, 2926, 3132, 3133, 3134
	W	1492, 1739A, 2098A, 2218, 2473, 2766, 2775, 2844, 2926, 3132, 3133, 3134
	ZE	1686, 2066A, 2261, 2307, 2689A, 3142
	SE	2307, 3067
	Hfs	1862A, 2066A, 2232, 2403, 2515
	IS	2232, 3071
	IP	2218, 2374, 2766, 2775, 2844, 2874
	PT	1733
	AT	1626, 2095, 2178, 2461, 2844, 2922, 3017, 3132, 3134
	OT	2674
Ba II	ND	2773
	Hfs	2511A
	IS	2554
	AT	2473, 2773
Ba III	EL	2483A, 2925
	CL	2483A, 2925
	W	2483A, 2925
	IP	2925
La I	EL	2052A, 2105, 2536, 2889A
	ND	1733, 2105, 2831
	CL	2052A, 2536
	W	2052A, 2536
	ZE	2536
	Hfs	1429, 1694A, 1715, 1755, 2052A, 2536
	IS	1694A, 2831
	IP	2374, 2869
	PT	1733, 2052A, 2536
	AT	1725, 2423
La II	ND	1564
	PT	1353, 1365, 1564
	AT	1623
La III	EL	1338
	CL	1338
	W	1338
	AT	1582, 1725
La IV	EL	1366A, 2925
	ND	1958
	CL	1366A, 2925
	W	1366A, 2925
	IP	1366A, 2925
	PT	1366A, 1597, 1835
	AT	1598, 1666, 1725, 1958, 2364, 3177
La V	AT	3177
Ce I	EL	2889A
	ND	1946, 2188
	CL	1636
	W	1636
	IS	1688A, 1946, 1948, 2496A, 3006
Ce I—Continued		
	PT	2053A, 2188
	AT	1725, 1946, 1948, 2188
Ce II	ND	1946
	CL	1636
	W	1636
	IS	1946, 1948
	AT	1946, 1948
Ce III	EL	1734
	ND	1751
	CL	1734
	W	1734
	PT	1353
	AT	1725, 1751
Ce IV	EL	2323, 2342A, 2344, 2346, 2347, 2363, 2452A
	ND	1958
	CL	2323, 2342A, 2346, 2347, 2363
	W	2323, 2342A, 2344, 2346, 2347, 2363
	IS	1417
	PT	1597, 2346
	AT	1582, 1725, 1958, 3177
Ce V	EL	1507, 2925
	CL	1507, 2925
	W	1507, 2925
	IP	2925
	AT	3177
Ce VI	EL	1507
	CL	1507
	W	1507
Pr I	EL	1854, 2054A, 2136A
	CL	2054A, 2136A
	W	2054A, 2136A
	ZE	1854, 2054A, 2136A
	Hfs	2054A
	PT	2054A
	AT	1725, 2439
Pr II	EL	2054A
	CL	2054A
	W	2054A
	ZE	2054A
	Hfs	2054A
	PT	2054A, 2469
Pr III	EL	2469
	ND	1376, 1751, 2469
	CL	1376, 2466, 2469
	W	2466
	PT	1376, 2469
	AT	1431, 1510, 1618, 1725, 1751
Pr IV	EL	2342A, 2343, 2344, 2345, 2366, 2452A, 2457A, 2462A, 2520, 3228
	ND	1325, 1751
	CL	2342A, 2345, 2366, 2520, 3228

Pr IV—Continued	W	2342A, 2343, 2344, 2345, 2366, 2520, 3228
	SE	2462A
	Hfs	2147, 3004
	PT	1353, 1376, 1597, 3228
	AT	1431, 1510, 1561A, 1725, 1751, 1765, 2116, 2147, 2646
	OT	1325
Nd I	EL	1335
	ND	1335
	CL	2217
	ZE	1335, 1814
	Hfs	1814
	IS	1332, 1688A
	IP	2300
	PT	1335
	AT	1539, 1725, 2300
Nd II	EL	1335, 2141
	ND	2084A, 2141
	ZE	1335, 2141
	IS	2084A, 2353
	IP	2300
	PT	1335, 2141, 2469
	AT	2300, 2353
Nd III	IP	2300
	AT	1618, 1725, 1937, 2300
Nd IV	EL	2342A, 2343, 2347, 2366, 2377, 2452A, 2610, 2723, 2768, 3228
	CL	2342A, 2347, 2366, 2377, 2610, 2723, 2768, 3228
	W	2342A, 2343, 2347, 2366, 2377, 2610, 2723, 2768, 3228
	Hfs	2147
	IP	2300
	PT	1740, 2610, 2723, 2768, 3228
	AT	1618, 1725, 1751, 2147, 2300
Nd V	EL	3059
	CL	3059
	W	3059
	IP	2300
	PT	3059, 3113
	AT	2300
Nd VI	IP	2300
	AT	2300
Nd VII	AT	2300
Pm I	W	1741A
	Hfs	1741A
	AT	1725
Pm II	EL	1741A
	CL	1741A
	W	1741A
	Hfs	1741A
Pm III	AT	1725
Pm IV	EL	2262
	CL	2262
	W	2262
	PT	2262
	AT	1618, 1725
Pm V	AT	1618
Sm I	EL	1888A, 3054
	CL	1888A
	W	1492, 1888A
	ZE	1850
	Hfs	1850
	IS	1688A, 2496A
	AT	1540, 1543, 1570, 1725
	OT	1994
Sm II	AT	1570
Sm III	EL	2365, 2391, 2451A, 2458A, 2463A
	CL	2365, 2391
	W	2365, 2391
	IP	2316
	AT	1540, 1543, 1570, 1725, 1937
Sm IV	EL	2342A, 2344, 2354, 2452A, 2455A
	CL	2342A, 2354
	W	2342A, 2344, 2354
	PT	1870, 1887
	AT	1570, 1725
	OT	1432
Sm V	AT	1618
Sm XXXV	EL	2424
	CL	2424
	W	2424
	AT	2424
	OT	2424
Eu I	EL	2252, 2502
	ND	2502
	CL	2252, 2502
	W	2502
	Hfs	1436, 1695A, 1972, 2314
	IP	2502
	SF	2502
	PT	2141
	AT	1541, 1542, 1570, 1725, 1931, 1937
Eu II	CL	3178
	W	3178
	AT	1570, 1931, 1937
Eu III	EL	2133, 2342A, 2350, 2354, 2367, 2413, 2464A, 2539, 2830
	ND	2349, 2539
	CL	2133, 2342A, 2349, 2350, 2354, 2367, 2413, 2539
	W	2133, 2342A, 2350, 2354, 2367, 2413, 2539
	Hfs	1436
	IP	2539
	PT	2349, 2539, 2830
	AT	1541, 1542, 1570, 1725, 1931, 1937

Eu IV	EL	2045, 2070, 2342A, 2344, 2345, 3228
	CL	2045, 2070, 2342A, 2345, 2816, 3228
	W	2045, 2070, 2342A, 2344, 2345, 3228
	PT	1597, 3228
	AT	1540, 1543, 1570, 1725, 1931, 1937
	OT	1432
Gd I	EL	1337, 1414
	ND	1337, 1414, 2141
	ZE	1414
	PT	1337, 1374, 1414, 2141
	AT	1540, 1543, 1725, 1937
	OT	1994
Gd II	EL	1413
	ND	1413
	CL	1413
	W	1413
	ZE	1413
	PT	1413, 2141
	AT	1937
Gd III	EL	2283
	CL	2283
	W	2283
	IP	2316
	AT	1540, 1543, 1725, 1937
Gd IV	EL	2250, 2452A
	CL	2250
	W	2250
	PT	1597, 2250
	AT	1541, 1542, 1725, 1937
Gd XXXVI	EL	2424
	AT	2424
	OT	2424
Gd XXXVII	EL	2424
	CL	2424, 2460
	W	2424, 2460
	AT	2424
	OT	2424
Gd XXXVIII	EL	2424
	CL	2424, 2460
	W	2424, 2460
	AT	2424
	OT	2424
Gd XXXIX	EL	2424
	CL	2424, 2460
	W	2424, 2460
	AT	2424
	OT	2424
Tb I	EL	1548, 2380
	ND	1337, 2380
	CL	1548
	W	1548
	ZE	1548
	Hfs	1754, 2064A
	PT	1754
	AT	1725
	OT	1994
Tb II	EL	2450
	CL	2450
	Hfs	1433
Tb III	EL	1820
	ND	1820
	PT	1820
	AT	1725
Tb IV	EL	2342A, 2343, 2344, 2354, 2356, 2452A, 2717, 2718, 2980, 3228
	CL	2342A, 2354, 2356, 2717, 2718, 2980, 3228
	W	2342A, 2343, 2344, 2354, 2356, 2717, 2718, 2980, 3228
	PT	2980, 3228
	AT	1540, 1543, 1725
Tb V	ZE	2420
	PT	2420, 3113
Dy I	EL	1415, 1880, 1998, 2141, 2437
	ND	1337, 1415, 1554, 2141, 2437
	CL	1880, 1998, 2141
	W	1880, 1998
	ZE	1880, 1998, 2141, 2437, 2780
	Hfs	1986, 2000, 2780
	IS	1433, 1552, 1554, 2141
	IP	2141
	PT	1337, 1554, 2141, 2437
	AT	1539, 1725, 1937
Dy II	EL	1871, 1872, 2141
	ND	1871, 1872, 2141
	ZE	1871, 1872, 2141
	PT	1871, 1872, 2141
Dy III	W	3004
	AT	1346, 1725, 1765
Dy IV	EL	2343, 2354, 2357, 2373, 2452A, 3004
	CL	2354, 2357, 2373, 3004
	W	2343, 2354, 2357, 2373, 3004
	PT	2141, 3004
	AT	1725
Dy V	EL	3113
	CL	3113
	W	3113
	PT	3113
Dy XXXIX	EL	2424
	CL	2424
	W	2424
	AT	2424
	OT	2424
Ho I	EL	1339, 1649, 1801, 2055A, 2141
	ND	1801, 2141, 2370
	CL	2055A
	W	1339, 2055A
	ZE	1339, 1799, 1800, 2055A, 2388
	Hfs	1799, 1800, 2055A, 2065A, 2359, 2388

Ho I—Continued		
	PT	1801, 2055A, 2141
	AT	1725
Ho II	EL	1339, 2450, 2535
	CL	2450
	W	2450
	Hfs	2450
	PT	2535
Ho III	EL	3004, 3049, 3114
	CL	3004
	W	3004
	ZE	3049, 3114
	Hfs	3004
	PT	3004, 3114
	AT	1725
Ho IV	EL	2345, 2360, 2368, 2452A, 3167, 3228
	CL	2345, 2360, 2368, 3167, 3228
	W	2345, 2360, 2368, 3167, 3228
	PT	1597, 3228
	AT	1539, 1725
Er I	EL	1337, 1344, 1953A, 2139A, 2370, 2480A, 2527A, 2535
	ND	2527A
	CL	1337, 1344, 1953A, 2139A, 2370, 2480A
	W	1337, 1342, 1953A, 2139A, 2480A
	ZE	2139A, 2480A, 2527A, 2535
	Hfs	1952
	IS	1552, 1939, 2582A
	IP	2300
	PT	1337, 2480A, 2535
	AT	1725, 2300
Er II	EL	1345, 1953A, 2139A, 2480A, 2527A, 2535
	ND	2527A
	CL	1345, 1953A, 2139A, 2480A
	W	1342, 1953A, 2139A, 2480A
	ZE	2139A, 2480A, 2527A
	IS	1939
	IP	2300
	PT	2480A, 2535
	AT	2300
Er III	EL	1925, 2469
	ND	2469
	CL	1925
	W	1925
	IP	2300
	PT	1925, 2469
	AT	1725, 2300
Er IV	EL	2342A, 2345, 2368, 2376, 2452A, 3228
	CL	2342A, 2345, 2368, 2376, 3228
	W	2342A, 2345, 2368, 2376, 3228
	IP	2300
	PT	1376, 1597, 1740, 1835, 3228
	AT	1725, 1765, 1962, 2300, 2646
Er V	IP	2300
	AT	2300
Er VI	IP	2300
	AT	2300
Er VII	AT	2300
Tm I	EL	1637, 2006
	CL	2006
	W	1492, 2006
	ZE	1621, 1637, 2006
	Hfs	1621, 1783, 1945
	IP	2006
	PT	1637
	AT	1725
Tm II	EL	1633, 1634, 2469
	CL	2469
	ZE	1633, 1634
	IP	1634
	PT	1633, 1634, 2469
	AT	1623
Tm III	PT	2469
	AT	1582, 1725
	OT	2470
Tm IV	EL	2342A, 2344, 2354, 2361, 2452A, 2520, 2990, 3037, 3079
	ND	3037
	CL	2342A, 2354, 2361, 2520, 2990, 3037, 3079
	W	2342A, 2344, 2354, 2361, 2520, 2990, 3079
	PT	1597, 1835, 2990, 3037, 3079
	AT	1670, 1725, 1962
	OT	1670, 2470
Yb I	EL	1337
	ND	1337, 1374
	CL	1374
	Hfs	2433, 2759
	IS	1492, 2759
	PT	1337, 1374
	AT	1725
Yb II	EL	2378
	CL	2378
	W	2378
	ZE	2378
	IP	2378
	AT	1623
Yb III	EL	2456A
	W	2391
	PT	1353, 2469
	AT	1582, 1725, 1735A, 1937
Yb IV	EL	2344, 2376, 3038, 3173
	CL	2376, 3038, 3173
	W	2344, 2376, 3038, 3173
	ZE	2970
	Hfs	2970
	PT	2348, 2970, 3038
	AT	1582, 1725, 1962, 3177

Yb V	AT	3177
Lu I	EL	1638, 1705
	ND	1638, 1705, 1880
	CL	1638
	W	1638
	ZE	1705
	Hfs	1515, 1632, 2079A, 2276
	IP	1638
	PT	1374, 1705, 1880
	AT	2423
Lu II	PT	1365, 2025
Lu III	EL	1402
	CL	1402
	W	1402
	Hfs	1402
	IP	1402, 2316
Lu IV	EL	1553
	CL	1553
	W	1553
	IP	1553
	PT	1553, 2469
	AT	1735A, 3177
Lu V	EL	1553
	PT	1553
	AT	3177
Hf I	ZE	1584
	Hfs	1584, 2067A, 2099, 2100, 2196
	IP	2374
Hf II	PT	2025
Hf IV	EL	2056A, 2538, 2603
	CL	2056A, 2538, 2603
	W	2056A, 2538, 2603
	IP	2538, 2603
	PT	2538
Hf V	EL	2538, 2585A
	CL	2538, 2585A
	W	2538, 2585A
	IP	2538
	PT	2469, 2538
	AT	2585A
Ta V	EL	1671A, 2236
	CL	1671A, 2236
	W	1671A, 2236
	IP	1671A, 2236
Ta VI	EL	2585A, 2591
	ND	2591
	CL	2585A, 2591
	W	2585A, 2591
	IP	2591
	PT	2591
	AT	2585A, 2591
W I	Hfs	2434
	IS	2434
W VI	EL	2056A, 2658
	CL	2056A, 2658
W VI—Continued		
	W	2056A, 2658
	IP	2658
W VII	EL	2585A
	CL	2585A
	W	2585A
	AT	2585A
W	W	2805
Re VIII	EL	2585A
	CL	2585A
	W	2585A
	AT	2585A
Os I	ZE	2500A
	PT	2375
	OT	2375
Ir I	ND	2806
	ZE	2189
	Hfs	2067A, 2189, 2806
	PT	2806
Pt$^-$	EL	1917, 1996A
Pt I	Hfs	2073A, 2838
	IS	2838
Pt II	IS	2269
Au$^-$	EL	1917, 1996A
Au I	EL	1336, 1502A, 2890A, 2891A
	ND	1336
	CL	1336, 1502A
	W	1336, 1418, 1502A
	SE	1371
	Hfs	1371, 1482, 1502A, 2072A
	IP	1336
Au II	EL	1336
	CL	1336
	W	1336, 1502A
	Hfs	1502A
Au III	EL	1336
	CL	1336
	W	1336, 1502A
Au IV	W	1502A
Au	W	1336
Hg$^-$	EL	2270, 3070
	CL	2270
	W	2270
Hg I	EL	1310, 2231, 2725
	ND	1779, 1839, 2441, 2879
	CL	1310, 2231, 2494, 2555, 2725
	W	1310, 2058A, 2231, 2494, 2555, 2725
	ZE	1514, 1524, 1604, 2422, 2745, 2785
	SE	1580, 2038, 2441, 2785, 2879, 3033
	Hfs	1400, 1477, 1519, 1596, 1604, 1647, 1657A, 1702A, 1938A, 2086A, 2400, 2422, 2569A, 2643, 2684, 2696, 2965, 3013, 3117

Hg I—Continued	IS	1400, 1596, 1647, 1657A, 1702A, 1781, 2086A, 2400, 2422, 2569A, 2586, 2684, 3013, 3088, 3117, 3231
	IP	2725
	PT	1310, 1779, 1839, 2441, 2879
	AT	1839, 3023
Hg II	EL	2975
	ZE	3094A
	Hfs	1981, 2526A, 2657, 3094A
	AT	2975
Hg LXXX	OF	1340
Tl⁻	EL	2296
Tl I	EL	1581, 3019, 3040, 3090
	CL	1581, 3019, 3040, 3090
	W	1581, 2867A, 3019, 3040, 3090
	SE	1464A
	Hfs	1520, 1706A, 2883, 2966
	IS	2883, 3093A
	IP	1581, 3040
	PT	1581
	OT	3148
Tl II	ND	1839
	PT	1839
	OT	2027
Tl III	EL	3138
	IP	3138
	PT	3138
Pb⁻	EL	1470
Pb I	EL	3233A
	CL	1551, 1930, 3233A
	W	1551, 1930, 3233A
	ZE	1718
	Hfs	1692A, 1860A, 2233, 2798, 2966
	IS	1528A, 1860A
	PT	1692A
	AT	1692A, 2922
Pb II	EL	2579
	CL	2579
	W	2579
Pb III	EL	1839
	ND	1839
	PT	1839
	AT	1839
Pb IV	EL	3138
	IP	3138
	PT	3138
Pb V	AT	1644
Bi⁻	EL	2296
Bi I	CL	1551
	W	1551, 2715
	ZE	1693A
	Hfs	1499A, 1511, 1692A, 1693A, 2002, 2074A, 2076A, 2334A, 2498A, 2499A, 2626, 2709

Bi I—Continued	IS	1499A, 2334A
	PT	1692A, 2498A
	AT	1692A
	OT	3099
Bi II	ND	2772
	Hfs	2772
	AT	1777, 2772
Bi IV	ND	1839
	PT	1839
Ac I	AT	2423
Th I	CL	2351
	W	2351, 2982
	IP	2312, 2374, 2392, 2758
Th II	EL	2372
	ND	2358, 2372
	CL	2351, 2358, 2372
	W	2351, 2358, 2372, 2982
	ZE	2372
	Hfs	2358
	PT	2358, 2372
Th III	EL	2362
	CL	2362
	W	2362
	PT	1353
	AT	1765
Pa V	EL	2476, 2544, 3126, 3229
	CL	2476, 2544, 3229
	W	2476, 2544, 3126, 3184, 3229
	ZE	2544, 3229
	PT	2476, 2544, 3126, 3229
U I	EL	1379, 1463, 1879, 2774, 2892A
	ND	1379, 1879, 2209, 2774
	CL	1379, 1813, 1879
	W	1363, 1379, 1463, 1813, 1879
	ZE	1379, 1879, 2774
	Hfs	1904, 2352
	IS	1379, 1879, 2352
	IP	1379, 2374, 2392
	PT	1879, 2209, 2774
	AT	1379, 1463, 2638
U II	EL	1379, 1463, 1879, 2774
	ND	1379, 2141, 2774
	CL	1379, 1813, 1879
	W	1363, 1379, 1813, 1879, 1903
	ZE	1379, 1879, 2774
	IS	1379, 1879, 1903
	IP	1379, 1463
	PT	2141, 2774
U IV	EL	2344, 3139, 3185
	ND	2264
	CL	3139, 3185
	W	2344, 3139, 3185
	ZE	3235
	PT	2264, 3139

U V	EL	2171, 2594, 2776, 3185, 3186, 3187, 3188, 3189, 3190, 3191
	CL	2171, 2594, 3185, 3187, 3188, 3190
	W	2171, 2389, 2594, 3185, 3186, 3187, 3188, 3190, 3191
	ZE	2171, 2776, 3189
	PT	2171, 2594, 3186, 3187, 3188, 3190, 3191
U VI	EL	2474, 2476, 3192
	CL	2474, 2476, 3192
	W	2474, 2476, 3192
	PT	2474, 2476, 3192
U	W	3068
Np I	EL	1678A
	CL	1678A
	W	1678A
	ZE	1678A
	Hfs	1678A, 1736A
	IP	2869
	PT	1678A, 1736A
	AT	1736A
Np IV	EL	2322A, 2454A, 2988, 3193
	ND	2264
	CL	2322A, 2988, 3193
	W	2322A, 2988, 3193
	PT	2264, 3193
Np V	EL	3186
	W	3186
	PT	3186
Np VI	EL	3194
	CL	3194
	W	3194
	PT	3194
Np VII	W	3195
Pu I	ND	3196
	Hfs	2132
	PT	3196
Pu II	Hfs	2132
Pu IV	EL	2222, 2248, 2355, 2790, 3175, 3197, 3198, 3199, 3200, 3201, 3216
	ND	3197, 3198, 3199, 3217
	CL	2222, 2248, 2355, 3197, 3199
	W	2222, 2248, 2355, 2790, 3175, 3197, 3199
	ZE	2355, 2371, 3198, 3199, 3200, 3201
	Hfs	2355, 3201, 3215, 3216
	PT	2248, 2264, 2355, 3197, 3198, 3199, 3201, 3217
	AT	1561A, 1765
Pu V	EL	3175, 3186
	W	3175, 3186
	PT	3186
Pu VII	EL	3175, 3194
	CL	3194
	W	3175, 3194
	PT	3194

Am III	EL	2297, 3202
	ZE	3202
	PT	3202
Am IV	EL	2251, 2344, 3196, 3203, 3214
	CL	2251, 3196, 3203, 3214
	W	2251, 2344, 3196, 3203, 3204, 3214
	ZE	2371
	PT	2251, 3196, 3203, 3214
Am V	EL	2222, 3201
	ND	3217
	CL	2222
	W	2222
	ZE	3201
	Hfs	3201
	PT	3201, 3217
Am VI	EL	3205
	ND	3205
	CL	3205
	W	3205
	PT	3205
Am LXXXV	OT	2129
Cm I	EL	1562A, 1563A, 2495A
	CL	2495A
	W	2495A
	IP	1563A
Cm II	EL	1562A
Cm IV	EL	3202, 3206, 3207
	ND	3202, 3206
	CL	3206
	ZE	3202, 3207
	PT	2264, 3202, 3206
Cm V	EL	2221
	CL	2221
	W	2221
Bk I	EL	1562A
	OT	1994
Bk II	EL	1562A
Bk IV	EL	2019, 2102, 2221, 2344, 3208, 3209
	CL	2019, 2102, 2221, 3209
	W	2019, 2102, 2221, 2344, 3208, 3209, 3210
	PT	2019, 2102, 3209
Bk V	EL	2019, 2686, 3208, 3209
	CL	2019, 2686, 3209
	W	2019, 2686, 3208, 3209, 3210
	PT	3209
Cf I	EL	1562A
Cf II	EL	1562A
Cf IV	EL	2103, 2222, 2344, 2449A, 2970
	CL	2103, 2222
	W	2103, 2222, 2344, 3211
	ZE	2970
	Hfs	2970
	PT	2103, 2970

2.2 Reference Numbers for Individual Spectra—Continued

Es I	EL	2225
	CL	2225
	W	2225
	ZE	2525A, 2947
	Hfs	2225, 2525A, 2947
Es II	EL	1562A, 2225
	CL	2225
	W	2225
	Hfs	2225
Es III	EL	3213
	ZE	3213
	Hfs	3213
	PT	3213
Es IV	EL	2224, 2249, 2344, 3038, 3150
	CL	2224, 2249, 3038, 3150
	W	2224, 2249, 2344, 3038, 3150, 3212
	PT	2249, 3038
Fm I	EL	1326, 1357
	ZE	1326
	PT	1326
	AT	1574, 1606
Fm XCV	AT	1728
	OT	1728
Md I	OT	1994
No III	EL	2298
Lr I	AT	2423, 2777
Trans Lr	AT	1445, 1544, 1546, 1629, 1732, 2724, 2777
	OT	1503, 1772

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Ar XIX, K XVIII, Ca XVI – XX, Ti XXI: W
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K XIV, Ca XV, Sc XVI, Ti XVII, V XVIII: EL
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P XIII, XIV, XV, S XIV, XV, XVI: EL CL W
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Fe XXIII, Ni XXV: EL CL W
Ti XIX, V XX: EL ND CL W
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Ca XV, Sc XVI, Ti XVII, V XVIII: EL ND CL W
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Al I, II, IV, VI – XI, Si I – XII, XIV: OT
P I – XIII, XV, S II – VII, X – XIV: OT
Cl I – VIII, XII – XVI, Ar I, III – VII: OT
Ar IX – XI, XIV, XV, K II – XVI, XIX: OT
Ca III – VII, IX, X, XII, Sc III, V – XV: OT
Ti III – XIII, V III – XV, Cr V, VI: OT
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Mn I – Ni IV, Mn$^-$, Fe I – Cu IV, Fe$^-$: OT
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Ca XII, XIII, XV, XVI: AT
Ti XIV, XV, XVII, XVIII: AT
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16. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

This is the first supplement to the NBS Special Publication 363, "Bibliography on Atomic Energy Levels and Spectra, July 1968 through June 1971," and it covers the most recent literature from July 1971 through June 1975. It contains approximately 2150 references classified by subject for individual atoms and atomic ions. A number index identifies the references. An author index is included. References included contain data on energy levels, classified lines, wavelengths, Zeeman effect, Stark effect, hyperfine structure, isotope shift, ionization potentials, or theory which gives results for specific atoms or atomic ions.

17. KEY WORDS *(six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons)* Atomic energy levels; atomic spectra; bibliography; energy levels, atomic; spectra, atomic; wavelengths, atoms and ions.

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